

LIST. - J. H. WILLIS

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The Author of each Article is responsible for
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PROCEEDINGS

The monthly meeting of the Club was held on April 14, 1947, at the Lecture Hall, Melbourne Public Library. The President, Mr. F. S. Colliver, and about 200 members and friends attended.

It was announced that assistance was required for the F.N.C.V. Junior Exhibit at the Community Festival, Exhibition Building, Melbourne, from May 14 to 24, 1947. Intending helpers should contact Mrs. J. J. Freame.

Nominations for the 1947 award of the Australian Natural History Medallion are due, and members are asked to submit names of suitable persons for consideration by the Committee.

The Treasurer, Mr. E. E. Lord, on behalf of the Committee, recommended that, as the financial year closes in the near future, the matter of proposed increase in subscriptions be held over until the receipts and payments for this year are known. New methods for the presentation of the Balance Sheet had been suggested, and some alterations in form would be made; it was felt, however, that in its present form relevant figures were given in the simplest way. The statement for this year would be prepared before next meeting and the discussions on the subject could then be re-opened.

The following were elected as Ordinary Members of the Club: Misses E. Macfie, F. W. McDonald, E. Williams, C. M. S. Gamble, I. F. Thomson, Mr. and Mrs. Noel Bryning, Mr. Trevor Clifford; and as Country Members: Misses L. P. Hill and A. Daphne Boyle.

RODONDO ISLAND

Mr. J. M. Bechervaise, F.R.S.A., gave a graphic account of his camp-out on this rugged mountain-island of Bass Strait—apparently the first landing ever made there. The lecture was illustrated by a series of slides and a motion picture film in colour, and a survey of the island's general natural history thereby presented. Following are some questions and answers given at the conclusion of the lecture:

1. What is the size of the island? *Ans.*: Approximately one square mile.

2. What type of granite does it consist of? *Ans.*: A tough red kind, very similar to that of Cape Woolamai.

3. What species of eucalypts are there? *Ans.*: *E. bicostata* of large size and another species not yet identified.

4. Were any shells found on the island? *Ans.*: No land forms were seen, but limpets and a few other small rock-loving forms of marine type were noted.

5. Was any trace of fire noted? *Ans.*: One tree definitely struck by lightning was the only trace of fire observed.

6. Were mosquitoes common? *Ans.*: No mosquitoes were felt or seen, but March flies were very common and caused the party to wear additional clothing for protection.

7. What type of soil was on the island? *Ans.*: Decomposed granite and humus mixture, varying in depth up to about 15 feet in some of the small gullies.

It was stated that no traces of human visitation to the island were seen, nor was there any evidence of other mammals, past or present. Snakes were apparently lacking also. Lizards were very common (two species, one apparently a varietal form of the mainland type.) Many birds common to the mainland were noted, and the mutton-bird population was prodigious.

LYREBIRD-FOWL HYBRID

Writing in the *Vic. Nat.* for June, 1946 (p. 47), Major H. M. Whittell asked if any further information was available in regard to a claim made by the late A. W. Milligan, in 1904, that he had bred and exhibited hybrids between the lyrebird and the common fowl. To that I replied with a quotation from a note published in 1922 in which it was claimed that lyrebird-fowl hybrids had been known in the Twofold Bay district of N.S.W. Recently I have come upon another paragraph on the subject. The cutting is undated but apparently was taken from *Nature Notes* in the Melbourne *Argus* about 1907. It credits a Mr. R. Davis, of Wallalla, with the statement that when he kept fowls in a bush area a male lyrebird developed the habit of feeding with them and eventually paired with a black Spanish hen. The fowl laid in the scrub and brought out a clutch of chicks. "When they grew up they resembled a lyrebird in every way excepting the tail of the male lyrebird. The feathers, legs, beak, and bill were just the same as those of the lyrebird."—A. H. CHISHOLM.

NOTE ON SPIDERS

For two years I have watched spiders demolishing their old webs and literally stuffing the old silk down their throat; but last week, while watching one closely, I saw it twice eject a little grey pellet from its mouth. I didn't have the presence of mind to catch the pellets, but I still have the spider under observation. The pellets must have been the old silk.

(Mrs.) HELEN MCKENZIE.

EXHIBITS AT APRIL MEETING

Mr. V. H. Miller: Miocene and Pleistocene fossils from Mt. Gambier.

Mr. Ivo C. Hammet: Cultivated native shrubs from Ivanhoe.

Dr. Margaret Chattaway: Collection of 16 native plants from the highlands of southern Tasmania.

A NEW SPECIES OF PRASOPHYLLUM

By the REV. H. M. R. RUPP, Northbridge, N.S.W.

P. UROGLOSSUM, sp. nov.

Planta moderate robusta, usque ad 45 cm. alta. Folia lamina magnopere inflorescentiam excedens. Flores numerosi in spicam densam 7-12 cm. longam, illi in medio primo expandentes, fusco-purpurei. Sepalum dorsale usque ad 8 mm. longum, latissime lanceolatum venis principalibus 3. Sepala lateralibus c. 8 mm. longa, aperta, linearia, ad basem vix gibbosa, breviter divaricata, deinde parallelia. Petala breviora. Labellum pullissimum, c. 6 mm. longum, in medio ad 45° flexum, tunc inter sepala lateralibus rigide protrudens; callus longus, fere amembranosus. Columna c. 3½ mm. alta appendicibus latis et 4 mm. altis. Ovarium gracile.

Distribution: N.S.W., at Burrawang; collected by A. W. Dockrill, Nov., 1946. (TYPES lodged in the National Herbaria of Sydney and Melbourne.)

A moderately robust plant 30-45 cm. high. Leaf lamina emerging high up the stem, and usually extending far above the inflorescence. Flowers numerous in a rather dense spike 7-12 cm. long, dark brown with prune tints, the buds opening from the middle of the spike upwards and downwards. Dorsal sepal up to 8 mm. long, very broadly lanceolate, margins often inturned, primary veins 3, conspicuous. Lateral sepals about 8 mm. long, quite free, linear, hardly gibbous at the base, shortly divaricate there, then almost parallel. Petals shorter and paler. Labellum very dark, not much shorter than the sepals, abruptly reflexed at a right angle about the middle, then somewhat rigidly protruding between the lateral sepals like a tail; callus extending well beyond the bend, not quite as dark as the rest of the labellum, and almost devoid of any membrane. Column about 3½ mm. high, with rather wide appendages higher than the column (4-4½ mm.). Ovary rather slender, very shortly stalked, forming an acute angle with the axis.

It is somewhat remarkable that so distinctive a species, belonging to the section *Euprasophyllum*, should have remained so long undiscovered within little more than 50 miles of Sydney. Affinities are with *P. fuscum* R.Br., but *P. uroglossum* is a much larger plant, and differs in other and more important respects, as may be seen from the description. The character of the labellum, in particular, is surely unique: it is bent at an almost perfect right angle at the middle, and the anterior half is rigidly extended like a tail between the paired sepals.

The name has been given in allusion to this feature, and was suggested by Mr. J. H. Willis of the Victorian National Herbarium. Exceptionally long appendages of the column are also of note.

MACQUARIE ISLAND

By A. H. MATTINGLEY, Melbourne.

Just before the outbreak of World War I, I was asked by the Royal Society for the Protection of Birds to report on the alleged cruelty used to obtain oil from the penguins of Macquarie Island.

Previous to this I had made arrangements with a Mr. Burton, whose brother was employed at the National Museum, Melbourne, to obtain a vessel to transport me from the Bluff, New Zealand, to the isle. Mr. Burton had spent three years on Macquarie Island and knew it well, and the attendant dangers thereat. Burton died before the arrangement eventuated. He, however, gave me a lot of notes regarding the island. Later on Mr. Joseph Hatch, who leased the island, gave me further notes and also gave a lantern night at the Field Naturalists' Club of Victoria to prove that no cruelty occurred in killing the birds, as had been widely alleged.

To be able to give a first-hand report I made arrangements to accompany Mr. Hatch to the island to see and film the process, but wartime exigencies precluded my transport there. Most of the notes given me (which I have recently found) are presented herewith, as well as other information.

The sub-antarctic Macquarie Island is a lonely isle about 860 miles S.E. by S. from Hobart, set in a wilderness of waves and in the southern seas about 600 miles S.W. from New Zealand. It is a dependency of the Commonwealth of Australia and is under the control of Tasmania. It is in latitude 55 degrees S. and is about 20 miles long by about 5 miles wide in its broadest part. It consists of a series of almost bare hills, the highest reaching to 1,300 feet. It may be likened to a tile set on edge in the sea. Several small lakes are found on the uplands. It is subject to blizzards from the west, and has a very damp climate, being frequently enveloped in clouds. Small streams, bogs and rain squalls are encountered. Some of the lakes are margined with a moss-like growth which grows very thickly and appears safe to walk upon, but should one attempt this he will sink through the floating mat and be precipitated into icy-cold water.

There are no trees or thick scrub, but the principal vegetation is a tall tussock grass, the so-called Macquarie cabbage, and the large cushion-shaped masses of azorella, sage green, close-growing pleurophyllum, beside other minor plants, ferns and mosses.

For some years Mr. Hatch leased the island for the purpose of obtaining penguin and elephant-seal oil, and established thirteen digestors for this purpose. Needless to say, the climate is severe. During the summer, daylight lasts from 2 a.m. to 10 p.m., and snow-storms are not uncommon in mid-summer. The southern lights or aurora which are seen on cloudless nights display their attractive colours to brighten up the drab effects.

There are no proper harbours and the forbidding rocky shores afford little shelter for shipping in the open roadsteads. The chief landing spots are the Nuggets and Lusitania Bay. Many shipwrecks have occurred, and the survivors suffered severely.

There is now no one inhabiting the island and no killing of the penguins or seals for their oil, but the numerous sealers and whalers recently let loose may raid the penguins if these are not protected by a warden. To the naturalist the flora and fauna of the island afford great interest. Experiments made by the oil gangs to grow vegetables there were a rank failure. Cabbages grew only stalks, with leaves as large as a sixpence. Carrots and turnips grew into stalks of wood. Beans and potatoes were very much undersized and were ruined by frost.

The island is a home for seals, which breed thereon. The elephant seal has a proboscis about 10 to 12 inches long, which gave it the name of elephant—as well as its great size. The largest bull has a harem of from five to ten females, according to his ability to fight to retain them. The largest bulls measure up to 22 feet in length and weigh from five to six tons. The females come ashore to produce their pups during September. After remaining ashore for about two months they all proceed to sea with their young. In December the old ones return to shed their coats.

Leopard seals usually visit the island in May and leave again in February. They are graceful in contour, spotted, and about seven feet long. They can be dangerous when wounded, and they destroy many penguins; they hide in the kelp to pounce on their prey. A few true fur seals—once numerous, but brought to the verge of extinction by sealers—may still be encountered.

The largest bird is the king penguin; it stands three feet high. It has a bluish coat and white under-parts. The bill, head, and feet are black, and about the cheeks and neck there is a yellowish band. The bird saunters along with a dignified air and shows no fear of man. It is an inquisitive bird and examines anything one may be doing. Its call suggests "I have not got time," and is uttered with the bill pointed skywards; then the bird bows its head to the ground.

Penguins usually fish in the Macquarie Island area and when ashore frequent the damp gullies or streams. They commence to lay early in November, and incubation lasts about six weeks. Their single egg is incubated by resting it on their broad webbed feet; then they project a fold of their feather-coated abdominal skin over it. Both birds hatch the egg and dexterously change it over to one another to defeat the marauding skuas. The young remain with their parents for eleven months or until the hen bird is about to lay once again. The young then moult and go to sea, led by the old birds, which return in about a fortnight and moult also.

The young in down are a dusky brown. They feed by thrusting their bill and head into the mouths of their parents, who regurgitate the meal into the beaks of their young.

The parents regularly go to sea to hunt for food and arrive back overloaded so much so that they can hardly stagger ashore. When they arrive back the old birds wait for a big wave to wash them higher upon the beach. Should they miss their footing they head out to sea, dive through the breakers and try again. They are fattest during November and December.

The Royal penguins are next in size to the Kings and are by far the most numerous of the four species of penguins inhabiting Macquarie Island. They are there in thousands. One rookery is five miles long. This penguin is about two and a half feet high, has a conspicuous bright yellow forehead and crest, coat blue-black, under-surface silky white. The bill is a reddish-brown. These penguins arrive in September, the bulk of them about the middle of the month, and commence laying their single egg about October 11th. When unattended the young lie about in heaps, birds piled one upon the other, probably for protection.

The sagacity of the parents must be great to enable them to identify their young in the teeming throngs of them, when they arrive to feed them. When full grown the young are led to sea by their parents, the old birds returning in about a fortnight, very fat. On their return they commence to moult; this process occupies about one month. After the moult they quit the island for good by the end of March. The birds of this species were the ones rendered down for their oil.

When the young are ready to go to sea the old birds nudge them down to the beach over long distances. Should the sea be very rough the old birds make out to sea and create an oil slick to calm the billows so that their young will not be unduly buffeted.

Years ago the weka of New Zealand was liberated on the island and it has multiplied. Wekas are comparatively tame and would provide sustenance for shipwrecked mariners.

It is time that Macquarie Island was protected by a warden and effectively occupied as an outpost of the Commonwealth of Australia. There are several valid reasons for its occupancy and protection, and to prevent it from being raided for its oil by adventurers.

THE SENSES OF BATS

Anyone interested in the flight habits of bats, and the manner in which these fascinating creatures guide themselves through the dark by echolocation, will enjoy an illustrated article by Brian Vescey-Fitzgerald in the January number of *Endeavour* (I.C.I. Journal, London). Much information is given on the emission and reception of super-sonic vibrations among different species of British bats.

GOSSIP FROM MY GARDEN

By EDITH COLEMAN, Blackburn, Vic.

One of the most interesting things to watch in the garden during March and April is the small gangs of birds gathering together, evidently for play, or to teach the younger ones. Spinebills and sparrows are especially friendly. Five male blackbirds have been frolicking at my door, so different from their attitude towards each other later on.

Hyacinth Orchid

This plant (*Dipodium punctatum*) was very abundant in the Blackburn district before so much land was cleared for settlement. The open-timbered country, mainly messmate, red-gum and yellow-box, appeared to suit it. For more than 22 years, in a nearby Blackburn garden, plants of this orchid have increased and flowered naturally in an undisturbed part of the ground.

Some 20 years ago we noted a small patch of the autumn bird-orchid (*Chiloglottis reflexa*) on our land at Healesville. This has increased and spread in the well-known manner of this orchid under natural conditions. As the plants are out of all proportion to the number of flowers produced, one assumes that the increase is vegetative. Some 15 years ago one plant of this orchid was brought from Lysterfield by Mr. A. B. Braine and myself. It was planted at the foot of a gum-tree and left quite undisturbed. This, too, has increased into a small colony.

The late Lieut-Colonel Goadby showed me a large spreading patch of *Microtis* (sp. ?) which had increased in a similar manner on his lawn.

The Bag-Moth Again

I was recently given a copy of *Intelligence in Plants and Animals*, by Thomas G. Gentry, D.S.C. (New York, 1900). One chapter is devoted to an American bag-moth (*Thyridopteryx ephemeraeformis*), the larvae of which are called sack-bearers or basket-worms. The life processes appear to run parallel with those of our own bag-moths, although Dr. Gentry states that few people have seen the mature insect. I was impressed by the following passage:

The female moth is wingless and never leaves the bag, but makes her way to its lower orifice and there awaits the attendance of the male. She is not only without wings but is devoid of legs also, being, in short, nothing more than a yellowish bag of eggs with a ring of soft pale-brown silky hair near the tail.

After pairing the female deposits her eggs, intermingled with fawn-coloured down, within the empty pupa-case. When this task is completed she works her way out of the case, drops exhausted to the ground, and dies.

It will be noted that Dr. Gentry's adult female leaves the pupa-case when her metamorphosis is complete, meets the male, and then deposits her eggs *within the empty pupa-case*. Unfortunately, he does not describe her method of depositing her eggs inside the pupa-case. One assumes that she, like other moths, is able to use her ovipositor by touch, since she is not able, in her egg-swollen condition, to re-enter the pupa-case.

Birds of the Hearth

Bird-watchers must have been impressed by the number of species in which parent birds return year after year to a favoured nesting-site. One need only cite the swallows, magpie, grey thrush and willie-wagtail. Blackbird and song-thrush frequently refurbish and use a last season's nest. One assumes that they become attached to one house-site, probably because it has proved a safe one.

For 12 years I had watched my neighbour's white cockatoo take its morning and evening flight high over our trees. It frequently came into our garden, or settled in our trees. Although it had never been caged or chained, it always returned home before dusk. It was brought from Croydon, where it enjoyed similar freedom. Recently I missed it, and was told that as it had become addicted to pulling out the clothes-pegs from neighbours' lines, it had become necessary to chain it. Evidently the loss of a long-enjoyed freedom caused its death, for it lived only a short while after this indignity.

FLOWERING OF A POTTED HYACINTH ORCHID

With reference to Miss Wright's note in the March number of the *Victorian Naturalist* (p. 236), I would like to mention that on December 9, 1940, I exhibited at the Club meeting a pot of *Dipodium punctatum* in flower. This was considered, at the time, to be the first instance of the Hyacinth Orchid having been successfully cultivated (see *Vict. Nat.*, Jan. 1941, p. 158).

Mr. V. Bennett, of Canterbury, had grown it in ordinary garden soil, and the flower stalks appeared three years after potting. Recent enquiries of Mr. Bennett elicited the fact that after a *second* period of three years, flowering shoots appeared again and were in bud when a rat destroyed the plant—it never came up subsequently. It would be interesting to note whether plants in the bush ever exhibit a triennial flowering habit.

CHAS. FRENCH.

Egg collecting is a hobby of the past. Its days of usefulness are gone, and it now leads largely to a great waste of life without offering any adequate scientific return. . . . A study of a bird's behaviour around one nest yields more of scientific value than thirty years of egg collecting.—From *Birds Around New York City*, by Allan D. Cruickshank (New York, 1942).

PLATE I



Left: *Mimosa pudica* in a Macquarie garden (about 1940).
Right: Individual flowers of same.
Photos: H. T. Reeves.

A NEW NAME FOR THE AUSTRALIAN COTTON PLANT (OR "STURT'S DESERT ROSE")

By J. H. WILLIS, National Herbarium, Melbourne.

GOSSYPIUM STURTIANUM, nom. nov.

[Synonymy: *Sturtia gossypoides* R.Br., 1849

Gossypium Sturtii F.v.M., 1862—illeg. (Art. 54).

Gossypium austrahense Todaro, 1862—illeg. (Art. 54).

Cienfugosia gossypoides Hochreutiner, 1902.

Gossypium gossypoides Gardner, 1930—illeg. (Art. 61). (Non *G. gossypoides* Standley, 1923—Mexico.)]

+ *G. STURTIANUM*, var. *TRILOBUM* (F.v.M.) comb. nov.

[Syn. *G. Sturtii*, var. *trilobum* F.v.M., *Fragmenta IX* (1875) 127, in obs.]

It is indeed unfortunate that a very lovely and popular Australian flower has, for almost a century, borne several scientific names, none of which has been entirely correct on taxonomic grounds or according to the Rules of Nomenclature. The chief purpose of these notes is to set the matter right.

In the Appendix to Captain Charles Sturt's *Narrative of an Expedition into Central Australia, 1849*, we read (Vol. 2, App. p. 68), the first description of this plant by Robert Brown. The locality is given as *In the beds of the creeks on the Barrier Range—Sturt*, and Brown observes, *inter alia*:

Sturtia is no doubt very nearly related to *Gossypium*, from which it differs in the entire and distinct leaves of its foliaceous involucre, in the sharp teeth and broad rounded sinuses of the calyx, and possibly also in its fruit and seeds . . . at present unknown.

In 1862, both F. von Mueller (*Fragm. III*, 6) and A. Todaro (*Osserv. Spec. Cotone Cult. Palermo*, 19) considered the plant a true cotton and each independently placed it in the genus *Gossypium*, the former bestowing a new specific epithet, *Sturtii*, and the latter botanist another one, *austrahense*. These names are illegitimate, however, for they contravene Article 54 of the Rules, which requires that the *original* epithet (in this case *gossypoides*) be used upon transference to another genus—except in certain specified circumstances.

B. Hochreutiner, 1902 (*Ann. Conserv. and Jard. Bot. Genève*, 56), restored the first epithet *gossypoides*, but combined it with the generic name *Cienfugosia*—a systematic position which only Domin seems to have recognized. Next came C. A. Gardner (*Enum. Plant. Aust. Occid.*, 79), who reinstated our plant among the cottons and gave to it the name *Gossypium gossypoides* in 1930. This would have been the correct name today, had it not

been rendered illegitimate by the existence of another *G. gossypifolius*—a Mexican species published in 1923 by Standley (*Contr. U.S. Nat. Herb.* XXIII, 783). Article 61 holds that later homonyms are illegitimate and must be rejected.

Thus we are left without a name, and I have chosen the new epithet "*Sturtianum*" because it is etymologically similar to Mueller's well known *Sturtii*, while continuing to honour the original discoverer. As for a vernacular, "Sturt's Desert Rose," "Darling River Rose" and "Cotton Rose-bush" are popular and admittedly musical, but the shrub is neither a rose nor even rosy; I prefer *Australian Cotton*, which has meaning, was applied by Ewart in his *Flora of Northern Territory* (1917), and has recently been adopted in *Standardized Plant Names* (Harrisburg, U.S.A., 1942).

Sir George Watt³ who gives an excellent plate and full description of our Australian Cotton, makes the rather astonishing statement: "This tall, very ornamental wild shrub was originally collected during the McDougal Sturt journey to the interior of Australia in 1839." Does he mean John McDouall Stuart [incorrectly styled "Mr. M'Dougate Stuart" in Sturt's *Narrative*, p. 46] who accompanied Captain Sturt as surveyor and draughtsman?—the names Sturt and Stuart have often been confused by subsequent botanists. Whatever Sir George meant, there was no "journey to the interior of Australia in 1839" and the type specimens were collected during October or November, 1844.

Brief Descriptive Notes

Apart from the imperfectly known *Gossypium Robinsonii* F.v.M. (restricted to the Ashburton and Portescue River district, W.A.), *G. Sturtianum* is the only member of the true Cotton Plant genus native to the Australian region. It is confined to the arid interior, from Dampier's Archipelago in the far north-west to Dawson River in Queensland (Leichhardt District), from the Gawler and Flinders Ranges (S.A.) northward to beyond the Macdonnell Ranges in Central Australia; but apparently it is nowhere plentiful. The usual habitat is in rocky gullies or along sandy watercourses.

Australian Cotton will flourish under severe drought conditions, and when grasses fail it becomes a valuable stock food, of which sheep are particularly fond (*vide* Turner¹). It will probably never achieve fame as a commercial fibre plant—the capsule is under an inch in length and the woolly seed covering too sparse. Efforts to cultivate the plant on a large scale in moister districts have not met with much success. Watts² remarked: "It does not appear to have ever been cultivated and, in consequence, has not in any way contributed to the long series of cross-yielding races."

¹ Seeds are germinable for a short period only and should be sown where the plant is to remain; as young seedlings resent

disturbance. Propagation by cuttings has proved satisfactory, and individual specimens have done well in Melbourne, where they fulfil every requirement of an ornamental garden subject. The whole plant is glaucous, dotted with tiny dark glands. Tall shrub size is attained, the evergreen leaves being roundish and long-stalked, while the flowers are large, handsome, Hibiscus-like and mauve or bluish with deep purple centres.

RECENT DESCRIPTIONS IN ENGLISH

1. *The Forage Plants of Australia* (N.S.W. Dept. Agric.). F. Turner, 1891 (p. 10).
2. *The Queensland Flora* (Part I), F. M. Bailey, 1899 (p. 153).
3. *The Wild and Cultivated Cotton Plants of the World*, Sir George Watt, 1907 (pp. 63-65).
4. *Flora of South Australia* (Part III), J. M. Black, 1926 (p. 382).

SPREAD OF MISTLETOE

(To the Editor)

Sir,—I was very interested in your remarks on mistletoe (*Vic. Nat.*, March, 1947, p. 226) and, as opinions are invited, I beg to give you a few of my own ideas on the subject.

The increase in mistletoe plants is very apparent between Bright and Everton (along the Ovens Valley), and to a less extent on the Harrierville side of Bright—~~or was~~ pronounced when I resided at Bright some years ago. The parasites have certain natural enemies which assist in their control, notably *Lepidoptera* and *Cerambycidae* (wood-boring beetles).

Butterfly larvae of the genus *Delias* feed chiefly on mistletoe and one species (*D. harpalyce*, the Imperial White) used to be plentiful about Bright. Caterpillars of this butterfly are large and live gregariously, 30 to 60 or even more being found on the same mistletoe plant. Probably the parasite would have a struggle to survive at all if it were not for the aid to dispersal rendered by the Mistletoe-bird.

Isolated plants do very little real harm to a tree, but heavy infestation certainly saps its vigour. When living at Bright, I formed the opinion that mistletoes were more plentiful in open country, and so were starlings, which apparently destroyed the natural insect enemies of the former, thus upsetting Nature's balance in favour of the mistletoe. It is possible that the starling, being also a fruit-eater, might be a direct agent in spreading mistletoe seeds—has anyone observed it eating the berries?

It seems to me wrong to put all the blame on Mistletoe-birds before we have thoroughly explored all other possible agencies affecting dispersal. These lovely little creatures surely work no harder now than they did in ages long past.

Yours etc.,

—H. W. DAVEY.

Surrey Hills.

A ten-day Community Festival will commence at the Exhibition Building on May 14th, when music, art, physical culture, and schools' displays will be special features. Junior members of the Club are assisting and ask for support; but if rail travel be not restored by May 5, the opening of the Festival will have to be postponed.

NATIVE BEES OF TOORAK

By LYNETTE YOUNG, Melbourne.

Through the spring of 1946 and the summer of 1947 I collected, in my garden at Toorak, a number of native bees which, in spite of the changed conditions brought about by the cultivation of extensive house gardens, have somehow survived the disappearance of the original flora. A short note about them may not be out of place in the records of Victorian Field Naturalists, and may serve to help other observers of these interesting honey gatherers.

On the prolific pink blossoms of *Eucalyptus ficifolia* I have taken the large *Hylaeoides concinna* which could easily be mistaken for a wasp, its jet-black body slashed with a sash of brilliant vermilion. Smaller bees with blood-red abdomen, and the black head and thorax covered with a coat of pale golden hair, are referable to *Parasphecodes melbournensis*; they dig shafts in the ground.

Some jet-black bees spotted with butter-yellow, say, half an inch in length, are *Hylaeus chrysognatha*. On the lavender blooms of the border, and even on roses, there came an electric-blue-banded bee with an extremely rapid flight and shrill note as it darted from flower to flower; a rare visitor indeed, but a very beautiful one with an equally pretty name, *Anthophora australis*.

Tiny metallic green and red bees, which seem to be a long way from home, since they were described from Brisbane, are neat, busy little creatures rejoicing in the name of *Halictus brisbanensis*. A larger *Halictus*, with the specific name *leai*, is black with two or three bands of golden hair across the abdomen. These neat bees are slender and trim. Another small black *Halictus* favoured white flowers of the herb marjoram, a very industrious bee known as *H. victoriellus*. Dozens of males hovered over the blossoms before the larger females appeared several days later. On yellow flowers of the composite Flatweed (*Hypochaeris*), which will spring up in odd places in spite of my best endeavours to keep the garden free from weeds, is the very tiny *Halictus inclinator*—a pretty little bee with greenish head and thorax and a highly polished black abdomen.

Found on the same Flatweed flowers and also on Oxalis is a still smaller bee, only a millimetre or two in length; this is *Pachyprosopis Lynettae*, and its life in a telegraph pole has already been told by Mr. Tarlton Rayment, to whom I am indebted for the classification of the bees of my garden.

ARARAT F.N.C.

At the annual meeting on March 12 the following office-bearers were elected: President, Mr. Stan Kelly. Vice-Presidents, Messrs H. J. Blackie, A. Hargreaves, J. Norman-Bail. H. Butler, and Misses L. Baufeld and A. Mitchell; Hon. Secretary and Treasurer, Miss L. Guyot (78 Barkly Street, Ararat)

NEW BEES AND WASPS—PART V

The Male of *Paracolletes fervidus*, subsp. *subdulus* Cockerell.

By TARBTON RAYMENT, Melbourne.

The type of this species, a female, was described from "New Holland", by Smith (*British Museum Catalogue*), in 1879, but the male remains unknown.

The subspecies, another female, was described by Cockerell in 1913, the type specimen having been collected by our old Club member, Charles French, at Cheltenham, Victoria, some three miles from the author's present home.

In January, 1946, Owen Dawson (late R.A.A.F.) collected a large series of males and females of these handsome bees, at Tooradin, Victoria. They differ a trifle in the neuration of the wings, but are otherwise typical. During the same month he collected another series of males at Clyde and, strange to say, these were emerging through the new plaster on an old brick wall.

During February, 1946, Eyre Swarbreck collected a male on the verandah of his home at Highbett near Cheltenham, and the specimen is much longer than those from Tooradin and considerably larger than all the Clyde examples. The Revd. Brother Stanley, of Watsonia Seminary, Victoria, had in 1941 collected another male sheltering in the cavity of a tree.

Since the male of the subspecies has not hitherto been described, I select the Highbett bee as the Allotype.

Paracolletes fervidus subdulus Ckll.

(*Ann. Mag. Nat. Hist.* (8), xi, p. 279, 1913.)

ALLOTYPE: Male—Length, 12 mm. approx. Black.

Head small, face and frons masked with a dense mat of brilliant golden hair; clypeus and supraclypeal area hidden under the hair; vertex coarsely and densely punctured; compound eyes converging below; genæ with a long beard of slightly paler hair; labrum and mandibulæ black; antennæ blackish above, ferruginous beneath.

Prothorax not visible from above; tubercles and pleura with much reddish-gold hair; mesothorax shining between the coarse punctures, and disc with much long reddish hair; scutellum and postscutellum similar; metathorax with coarse transverse rugæ; abdominal segments with numerous punctures, hind-margins broadly depressed, 1 and 2 with much reddish-gold hair; black hair at apex; ventral segments with stiff fringes of appressed golden hair, shining, with scattered punctures and a tuberculate elevation on 5.

Legs black, with much golden hair, anterior pair with some ferruginous hair on inner surface; tarsi with anterior pair ferruginous, others black; claws reddish; hind calcar reddish-amber; tegulæ blackish, polished.

Wings dusky apically; nervures sepia (the first recurrent is variable in a series, on some joining the cubital cell at its middle, and on others at the basal third); cells: second cubital contracted at apex; pterostigma light-brown with a darker margin; hamuli ten, strongly developed.

Locality—Highett, Victoria, Feb. 1946. Eyre Swarbrock.

ALLOTYPE in the collection of the author.

Allies: This specimen may be a topotype, for the locality is only a mile or two from Cheltenham, whence the type was described.

BOTANICAL NOTES ON THE NORTHERN TERRITORY

By L. GILBERT, *Nabiac, N.S.W.*

PART I: THE SAVANNAH WOODLANDS

(a) *At Cape Don, Arnhem Land.*

Eucalyptus trees form the greater part of the forest vegetation here. One of the most common species is *E. miniata* ("Woollybutt"), a beautiful orange-flowered tree (to 50 ft.) with great woody fruits. This area, being skirted on all sides by the sea or swamps, is all within reasonable distance of the water, and the soil is very sandy. Species of *Pandanus* (Screw-pine) are most abundant, and *Melaleuca Leucadendron* (Cajeput) flourishes also.

Here and there throughout the forest are groves of a beautiful orange *Grevillea* with flower spikes up to 6 m. long and actually dripping nectar. This is probably the N.T. Silky Oak (*G. chrysodendron*), bearing some resemblance to *G. robusta*. The inevitable *Acacias* are in considerable variety. One is a type of "Bastard Mulga," but not very favourable to work because it tends to split easily. Specimens of a *Sterculia* (*ramiflora*?) with fairly large reddish bells is fairly common also. These shrubs are particularly conspicuous because of their deciduous habit.

Both woody and herbaceous climbers may be found. In January some trees are covered with the purple bells of an *Ipomoea*.

A tree with curious double tomato-like fruit of orange-red colour is avoided by natives and whites alike, since it is believed that any juice from the fruits or other contact with the tree would result in a rash of running sores. Such rashes are unlike those from *Laportea* spp. in that there is no actual sting, and the first evidence one has of any contact with the tree is the appearance of a great number of small weeping sores that itch considerably. Such rushes, even when treated with a mixture of methylated spirit and iodine, last for about a fortnight. Fallen fruits, when trodden upon, seem to be the source of some irritating juice.

Of the smaller plants, grasses are abundant throughout, especially during the wet season (November-March), when heights of six feet or more are attained. A species of *Pachynema* is very common, and on *E. miniata* are occasional specimens of a pretty epiphytic orchid with light brown flowers having yellow spots; these are fairly large and borne in long sprays (*Cymbidium Hillii*). Only one other orchid was seen here—a tall white terrestrial, which unfortunately was not collected.

Mistletoes are extremely common and varied. They seem capable of modifying their leaves to resemble those of the host plant, and were noted on *Acacia*, *Eucalyptus*, *Melaleuca* and other trees, during my sojourn there early in 1945.

(h) At Southport, 30 miles south of Darwin

More detailed observations were made here than at the previous locality. Again, *Eucalyptus minola* held a place of dominance, and again it was often the means of support for *Cynlidium Hillii*. In association with these grew fair numbers of the light-yellow-flowered *Xanthostemon broadax* and "Camel Poison" or "Ironwood" (*Erythrophisum Labouchei*), with its large dark pods. The soil was better in this area and a greater variety of vegetation was evident. Here and there were groups of *Grevillea*—usually of the one species. One with shell pink and greenish flowers and pinnate leaves is probably referable to *G. decurrens*. Another common species has pink to reddish flowers and leaves somewhat similar, but of much thicker growth. Another *Grevillea* is a small undershrub, procumbent with divided leaves and red flowers. Altogether, ten different species of *Grevillea* were collected southward from Alice Springs.

In damp areas were found groves of *Grevillea rhynodendron* with *Melaleuca Leucadendron* and *Pandanus* sp.—all three were comparatively rare in the drier open forest.

The beautiful deciduous shrub, *Euchloperman heterocurum*, was a very common sight, and most pleasing one—whether in leaf or covered with its large five-petalled Hibbertia-like flowers. One specimen had a stalk with 63 flowers (either not or slightly withered) and 85 buds, some of which were almost ready to open. This excellent specimen was observed on June 22, 1945, when the species seemed to be at the peak of its flowering period. Another fairly common deciduous shrub was a species of *Sterculia* (again probably *raufiflora*) and its clusters of pink or red bells, followed by large follicles on the otherwise bare branches, provided a contrast with the other plants.

As ever, Acacias were in their usual great profusion and variety, 21 different species being collected between Alice Springs and Darwin—and this by no means exhausted the number of species seen; moreover, there were enormous numbers not seen at all. Among those collected around Southport were *A. dividiata*, *A. ulocarpa*, and *A. discum*.

Scattered throughout the forests were specimens of *Persea falcata* and, not so frequently, a species of *Stakea* with light yellow spikes branching from a main flowering stem, with leaves like those of the *Persea*.

Great clumps of *Pachyneura* are common, and four species (?) were collected. One has the usual wide flat cladodes; another has cladodes not so wide, and grows near the former on occasions, but seemingly easily distinguished from it. Two other types have more or less rounded cladodes, but whereas one bears the small pink or white flowers all over the plant, the other has special flowering stems which rise well above the flowerless cladodes, often on the edge of the clump and somewhat separate from the rest of the plant. The first two types were seen growing about 30 miles south of Darwin and the other two in an area near Knuckes's Lagoon, 9 miles south. No doubt all four types exist between the two localities.

With these *Pachyneuras* grew bushy shrubs (about 18 in. high), specimens of which have been determined as *Petalostigma quadriloculare*. This is normally a tree, so perhaps the specimens seen were new growths from underground stems, or trees previously destroyed by fire.

Everlasting daisies are prolific throughout the open forest and grassy areas. There were large dark red ones, and another with almost identical heads, but white. Between these was found one—one specimen with a head consisting of both red and white flowers, so that the capitulum had a purplish appearance. Perhaps this was a natural hybrid. A species of papery *Polycarpha* with dark red flowers was also plentiful. Two procumbent everlastings were found, one bearing blue flowers and the other pink and white ones. A most striking everlasting was seen in places about

30 miles west of Southport. The heads were about 14 in. wide and stiffly textured. The colour was brilliant gold, and they made very fine herbarium specimens.

Here and there were groups of the tall *Trachymene hemicarpa* var. *rotundifolia* which grew to 3 in. or so and bore yellowish umbels. During the wet season the grass grows some 10 to 15 ft., after which it bends over and dries up, thus falling easy prey to the great grass fires which ruin the vegetation every year.

A small species of *Livistona* occurs in groves throughout the open forest. These palms grow to 6 or 8 feet and have the usual long sprays of tiny yellow flowers. The fruits are globular, not quite half an inch wide, and fairly dark. One fan-like frond examined was found to have 36 divisions. Very often a grove of Cycads grew close to the palms. These were either *Cycas media* or *C. Girsiana*. They grew 8-10 feet and were generally distributed from Adelaide River to Darwin. These trees were unfortunately exploited for their convenient round logs in the making of practically every military camp. It is fortunate that they exist in fair numbers.

Many types of daisies besides everlastingings were found—white, blue and yellow—and at least eight different species of these were collected.

Again, the mistletoes were common and were seen to grow on *Xanthostemon paradoxus*, *Erythrophloeum*, *Lobouchei*, *Acacias*, and many other trees. Ten apparently different species were collected. Many were extremely beautiful, especially one which seemed to favour *Xanthostemon* (also *Acacias* at Cape Don). It had large, almost fleshy leaves and flowers of a scarlet colour with yellow tips. The sprays were all upright as in the other species. In one river forest was seen a species of *Loranthus* growing on a Eucalypt overhanging the river, and on the *Loranthus* itself grew a specimen of *Viscum angulatum*. This parasite-on-a-parasite arrangement seemed to work satisfactorily.

A red *Pimela* (*punicra*?) was often seen in the grass, and grew to about two feet.

Occasionally, in damper areas, groves of *Banksia dentata* were noted—none trees were never seen. One isolated tree observed was a *Clerodendron* with characteristic long white bells, but no other one was found.

Apart from ubiquitous *E. miniata*, there were other types of eucalypts, and four other species (all with white flowers) were noted. In damper places, in association with the procumbent red *Grevillea*, *Goodenias*, *Pachynemias*, Everlastingings and other herbs, the small white-flowered *Coronella parviflora* abounded.

A MARINE ODDITY

A white slug-like animal which carries the shell on its back was found at Altona on March 1, pushing its way through the sand. The mollusc was left in water from Altona, which was probably fresh through heavy rain falling the previous day. At 9 p.m. I noticed a small swelling appearing from behind the shell, which had a yellowish-coloured gill attached. After half an hour, it was slowly withdrawn. From under the front portion of the shell appeared a proboscis with black pincer-like jaws, continually snapping and withdrawing several times for over an hour, then disappearing under the shell. I have examined several of these animals, but have not seen this happen before. Miss Joyce Allan (Sydney) has determined the species as *Sigambra* (*Sigambra*) *Zonale*.—M. E. FREAME

At Point Cook on March 14 some small fishes, with silvery stripe along the sides, were caught. These soldier-fishes (*Adenapogon wassi*) carry the eggs in the mouth until they hatch.—M. E. FREAME.

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PROCEEDINGS

The monthly meeting of the Field Naturalists' Club of Victoria was held on May 12, 1947, at the Public Library, Melbourne, the President (Mr. F. S. Colliver) and about 150 members and friends attending.

Considerable discussion took place, at a special general meeting preceding the ordinary meeting, on the proposal to increase subscriptions. An amendment in favour of an increase from 20/- to 21/- was rejected, and the original motion, which was sponsored by the Committee, to make the subscription 25/- city and 12/6 country, was carried by a large majority. The price of the *Naturalist* will be increased from 1/- to 1/6.

At the ordinary meeting Mr. H. C. E. Stewart gave notice of motion to provide for three additional offices, namely, Assistant Editor, Assistant Treasurer, and Excursion Secretary. Provisional nominations for these offices were accepted by the President pending discussion of the motion at next meeting.

The President announced with regret the death of Associate-Professor F. A. Singleton, and members stood in silence as a mark of respect.

The following were elected as ordinary members of the club: Miss Joan Marx and Mr. R. Stone; and as country member, Mr. A. B. Costin.

The following nominations for office were received: President, Miss Ina Watson; Vice-Presidents, Mr. A. J. Swaby and Mr. J. Ros Garnet; Hon. Secretary, Mr. F. S. Colliver; Hon. Assistant Secretary, Miss H. Kneip; Hon. Editor, Mr. A. H. Chisholm; Hon. Assistant Editor, Mr. J. H. Willis; Hon. Treasurer, Mr. E. E. Lord; Hon. Assistant Treasurer, Mr. Alan Carter; Hon. Librarian, Mr. A. Burke; Hon. Assistant Librarian, Mr. H. Preston; Hon. Excursion Secretary, Mr. A. A. Baker; Committee, retiring committee and Messrs. C. Lewis, R. Dunn and N. A. Hanson; Auditors, Messrs. A. S. Chalk and A. G. Hooke.

DR. CHATTAWAY'S LECTURE

Dr. Margaret Chattaway, of the C.S.I.R., gave the lecture of the evening, her subject being "Flora of the Chalk Downs." The lecturer showed first a series of illustrations depicting the archaeological features of the Chalk Downs and a map showing the extent of the area, after which she spoke of the birds and

flora. A commentary upon the illustrations went to the making of a highly interesting address. Several questions were answered and warm appreciation of the lecture was tendered Dr. Chatterway.

EXHIBITS

Mr. A. A. Baker: Contorted talc-schist from Bullumwaal, 20 miles north of Bairnsdale.

Mr. T. S. Hart: Felspar crystals mentioned in recent article.

Mr. C. J. Gabriel: Land snail (*Paryphanta busbyi* Gray) with egg; kauri-snail or "pupu-rangi" from New Zealand; also small Victorian land snail (*Charopa albanensis* Cox) with egg; specimen from Kinglake, collected by Mr. C. Oke.

THE RODONDO EPISODE*

By J. M. BECHERVAISE, F.R.S.A., Geelong, Vic.

There have been times of late when requests for articles on Rodondo have almost made me wish I had never landed on the lonely island; on the other hand, an intimation that the *Victorian Naturalist* would welcome a brief account had the reverse effect. That my friend Mr. J. H. Willis, of the National Herbarium, was prepared to write an addendum on the flora and its distribution acted as a powerful incentive.

The tale of Rodondo has at least three beginnings—geological, historical and personal. The first lies distant by twenty thousand years, when, during the last great glacial epoch of these parts, Rodondo and many other mountains became isolated islands in the newly formed strait, two hundred miles wide, between the mainland and what was recently called Tasmania. These plutonic peaks, chiefly of red granite—with the exception of Rodondo, which, by its greater height (1,150 ft.) and certain other factors, repulsed such a fate—have since become naked, perilous rocks, spray-swept and hospitable only to sea-birds.

Historically, the island is about one hundred and fifty years old, its first observation, its charting and its naming (after a rock bearing a superficial resemblance in the West Indies!) being the work of Bass, Flinders, and Grant respectively, all intrepid English maritime explorers.

I was introduced more than twenty years ago, when, from the Wilson's Promontory lighthouse, the Scottish keeper pointed it out as a sort of delightful challenge, on the southern horizon. Since then, until our attempt was successful, it had never ceased to stimulate and intrigue a youthful corner of my mind. It was an odd chance indeed that the fulfilment of a random boyish ambition should have flashed across most newspapers both here and abroad. Incidentally, at the time, we had no knowledge of this publicity,

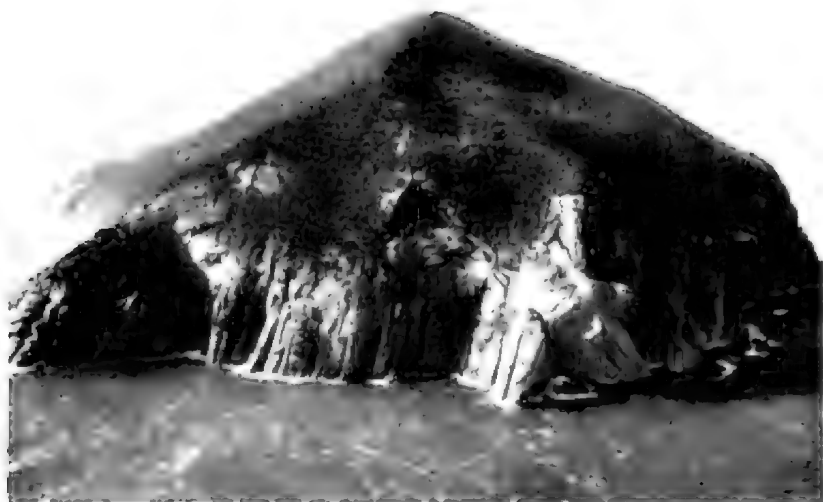
*Summary of address given by the author at the F.N.C. meeting for April.

PLATE II



Luxuriant growth of White Elderberry, Flax-lily, and Australian Stork's-bill on moist slopes of Rodondo Island.

Photo.: L. P. Greenhill.



Rodondo Island from the North.
Aerial view, by courtesy *Herald* Feature Service.

and even when a plane flew several times round the island we thought only that it might be an early reconnaissance by a pilot from Yarram who, we had been given to understand, might attempt to drop further supplies if we were still there in two months!

There are plenty of reasons which might be advanced for wishing to make the attempt; most of these needn't be expressed to readers of this article—they are too easily imagined. Scientifically, however, there was work to be done: to collect and, from an ecological point of view, to examine the flora and fauna; to search for artefacts which might bear relation to the extinct races of Victoria and Tasmania; to make a general study of a region which had never known the disastrous hush-fires which, times beyond number, have swept the mainland, gravely upsetting the balance of life after the high forest was destroyed.

All we knew of Rodondo had been gleaned through a powerful telescope and by flying over its cloud-wreathed hump. Both before I lived in England and more recently, since my return, I tried to interest south coast fishermen in the venture. Always I met friendly but firm refusals. Many labelled the project impossible. Official sources revealed no more encouraging information. Life-boats from a vessel mined in the vicinity during the recent war failed to find a landing; a radar station project had been abandoned, and so on. Last September, however, we achieved a promise of assistance from one of the most experienced men on the coast, George Smith of Port Albert. We waited, then, nearly a fortnight for a possible day—and finally returned home disappointed.

In January, however, the weather was perfect—a rare but essential condition in an area noted for its rough water. For months on end, observers at the Promontory Lighthouse have known the waves to dash up Rodondo's cliffs to a height of thirty or forty feet. Eventually we arrived in the eastern lee of the island with the sea as blue and calm as Dromana in summer. After a careful reconnaissance, we put out towards the cliffs in a large dinghy. We found just one rock which permitted a landing under such conditions. This meant that the task of examining the cliffs and finding a route could be achieved from a *terra firma* base (the more the "firma," the less the "terra"!)—a tremendous advantage.

The eastern cliffs, where we made the attempt, are the only possible approach. Although vertical in places, they are broken by terraces, so that difficulties are not continuous. We took the job slowly and gradually scrambled up until, about a quarter of a mile south and 450 feet above "landing-rock," we discovered a place where tents might be pitched.

The eight days spent on the island were devoted to collecting, eating voraciously, lying spread-eagled in glorious sunshine and

tending our condenser. This latter apparatus was necessary to provide fresh water from the salt sea, as the island is too steep for any of the bountiful rainfall to lodge or to produce other than the most ephemeral streams. The transport of sea water up four hundred feet of cliff (twice daily after meals!) gave us ample practice in granite climbing.

The chief interest of our botanical collection lay in the curious distribution of certain species, unknown on the nearby mainland; at least one, Cape Leenwin wattle (*Albizzia distachya*), is native to Western Australia. Forms were often robust, quite giant specimens of plants which are usually smallish on the mainland, e.g., *Apium australe*. Most interesting of all, perhaps, is the tenacious *Melaleuca armillaris*, chief tree of the island, though found neither on the Promontory nor on even the larger islands of Bass Strait. It would appear to be of aboriginal stock and, by the micro-climate which it provides, to have given shelter to innumerable other flora.

Space does not permit much comment on animal life. This consisted solely of birds, a vast number of entomic species, a possible new member of the *Anome* group of trap-door spiders, and two species of lizard. Whilst the bulk of the birds there are sea-dwellers, we found a considerable wealth of land types also, including those familiar colonists, the blackbird and goldfinch! The rare Cape Barren goose nested on cliffs, along with penguins, oyster-catchers and mighty Pacific gulls, whilst the upper slopes of the island abounded with the burrows of the short-tailed shearwater (*Puffinus tenuirostris*), whose colonies must have contained millions. We found no trace of human association, either ancient or modern, although since our return a certain fisherman has claimed "priority."

No longer is Rodondo a boyhood challenge. Fortunately there are others no less insistent, some near, some far. *Quo me cunctique rapit tempestas, deferor hospes!* The world abounds with Rodondos!

COMMENTS ON RODONDO BIRDS

Bearing on the above notes by Mr. Bechervaise, it is interesting to learn that the introduced blackbird and goldfinch have penetrated to Rodondo Island—as indeed they have to most parts of Victoria—and it is pleasant to reflect that the mutton-birds (shearwaters) have found at least one insular spot where they may breed unmolested.

But the most refreshing note, perhaps, relates to the nesting of the Cape Barren goose. This distinctive bird, which occurs in a state of nature only along the southern coast of Australia, has become rare in recent years, and its breeding is seldom observed. True, the species is not difficult to keep in captivity (as has been proved both in Australia and abroad), but reports of its "natural" breeding are much more welcome than occurrences of the kind in aviaries.—A. H. CHISHOLM.

PLANTS OF RODONDO ISLAND

By J. H. WILLIS, Melbourne.

Until Mr. J. M. Bechervaise and party landed on Rodondo last January and brought away samples of every plant they could find, the vegetation of this imposing islet had remained a complete mystery. Another important link is forged in the chain of Bass Strait floras and we can say that the last island, having a considerable forest cover, has now been explored botanically. Victorians should be proud of the fact that scientists and photographers from their own State have conquered this Tasmanian outpost and become the first to make its wonders known.

Mr. Bechervaise lays no claim to having collected *every* kind of plant that exists on Rodondo; neither moss, hepatic, fungus nor alga was among his specimens, but there are certain to be many species of these cryptogams in evidence at one season or another. However, the trophies and observations of his eight days' sojourn there afford the *only* information in existence, and are a good foundation on which subsequent botanists may build.

In the present paper it is not intended to give a word-picture of the island's plant cover and principal communities. That would be to duplicate an admirable account already published by Mr. Bechervaise in the April number of *Wild Life* (Vol. 9, p. 130), wherein we are introduced to: gigantic *Melaleuca* trees (with boles up to twelve feet in girth!) which near the cliff faces "crouch low and clutch at the wind with long gnarled arms"; a "quiet parkland" of tall eucalypti on the western slopes; drooping she-oaks, yellow bulbine lilies and violet trigger-flowers along the drier north; and everywhere charming banks of big white everlastings, storks'-bills, and deliciously scented white elderberry bushes.

Having handled Mr. Bechervaise's actual collectings (duplicate specimens were lodged at the Melbourne Herbarium), I venture to follow up his general notes to the *Naturalist* with a preliminary check-list of the flora, systematically arranged. But, before submitting this tabulation, a few notes on the statistical aspects of the flora and the interesting distribution of several species may not be out of place.

The floras of Wilson's Promontory (eight miles north of Rodondo), Kent Group (distant 50 miles E.S.E.) and King Island (130 miles S.W.) are fairly well known. Many botanists have browsed over the Promontory and the results of their various published findings were incorporated in Ewart's *Flora of Victoria*, 1930. King Island was the scene of an F.N.C.V. camp-out in November 1887, Kent Group another in November 1890; comprehensive lists of plants (determined by Baron von Mueller) for both areas were published in the *Naturalist*. Drawing upon these

sources of information, I have indicated against each Rodondo plant whether it occurs also in "Kent," "King," or on the "Prom."

Of the 40 vascular plants inhabiting Rodondo (one lichen, *Usnea barbata*, was also collected), 38 are indigenous and distributed among 29 different families, giving a density of 1.3 species per family—a rather low figure (cf. 2.2 for the sea-cliff vegetation of Phillip Island). *Compositae* and *Myrtaceae* are the largest families, each having three native representatives. It is singular that two other composites, *Brachycome diversifolia* and the uncommon *Leiolena sapina*, which occur on both Kent and Hogan (only 33 miles eastward) Groups were not observed at Rodondo, where one would expect to find them. *Kunzea ambigua*, such a conspicuous shrub on the Promontory cliffs, Glennie Isles, etc., is also wanting.

On the contrary, 18 Rodondo plants are not recorded for Kent Group, 12 not for King Island, and 5 not for Wilson's Promontory less than eight miles away—a very remarkable fact, since the island is essentially part of the old Promontory mountain system. Of these five absentees from Wilson's Promontory, four occur either on Kent, King, or nearer Bass Strait islands, leaving but one species which is truly isolated, viz., *Melaleuca armillaris*, the picturesque and dominant tree all over Rodondo. As far as we know, this species occurs nowhere else in Bass Strait and the nearest location is about Genoa, some 216 miles to the north-east!

In *Wild Life*, Mr. Bechervaise has referred the Rodondo *Melaleuca* to *M. pubescens*, the closely related Moonah which is common along portions of our Victorian coastline (Point Nepean, Torquay, etc.) and also in the Mallee. As the one primarily responsible for this unfortunate mistake, I now apologize, attributing my earlier erroneous determination to a too hasty examination of the Rodondo specimen—closer scrutiny would have revealed the long-clawed staminal bundles by which individual flowers of *M. armillaris* are at once distinguishable from those of *M. pubescens*, though the habit, bark, and foliage of the two species are very similar indeed. I never dreamt of checking up on *armillaris* as a possibility.

That *Melaleuca armillaris* should turn up as the principal tree on Rodondo Island is even more astonishing than if *M. pubescens* had been the particular species—as first believed; the latter does approach as near as 74 miles, in the vicinity of San Remo. From Genoa and Mallacoota, *M. armillaris* extends up the N.S.W. coast into Queensland, but why doesn't it occur on other eastern islands of Bass Strait (Hogan, Kent, etc.) or even on the Promontory? For a shrubby and avenue subject, it is much favoured in California, where fine specimens are growing at West Lake Park, Los Angeles, and San Mateo, San Francisco. H. M. Hall (*Univ. Calif. Publications in Botany*, Vol. 4—"Studies in Ornamental

Trees and Shrubs." 1910, p. 32) writes: "This I consider the best of the white-flowered sorts."

Six Rodondo species attain arboreal dimensions, viz., in order of size: *Eucalyptus bicostata* (to 100 ft.), *E. sp.* (a stringybark, probably *obliqua*), *Melaleuca armillaris* (to 60 ft.), *Casuarina stricta*, *Myoporum insulare*, and *Leucopogon parviflorus*. Nine other species are shrubs and the remaining plants mostly herbaceous perennials.

Of the two naturalized aliens, *Sonchus oleraceus* is also known from Wilson's Promontory and has doubtless arisen from wind-blown seed. It is an annual of almost cosmopolitan distribution and appeared in many parts of Australia coincident with early settlement (see *S. Aust. Nat.*, June, 1946—"Are the Sow-thistles Indigenous to Australia?" by Prof. J. B. Cleland). The truly indigenous, maritime *Sonchus megacarpus*, which perennates commonly on Victorian coastal dunes, was not among the Rodondo collectings.

Albizzia distachya, on the other hand, is a native of far south-west Australia (Cape Leeuwin area), and how long it has been a colonist on Rodondo we shall probably never know. This shrub is unknown on the Promontory, but was growing on Deal Island (Kent Group) as early as 1884—although the F.N.C.V. excursionists failed to find it six years later—and it is likely to have spread from there to Rodondo; the seeds, however, are rather heavy and would hardly have travelled 50 miles by wind—how else did they come?

SYSTEMATIC ARRANGEMENT

Distribution.

LICHENES		
Usneaceae	<i>Usnea barbata</i> (L.) Fr.—"Beard Lichen"	Prom.
PTERIDOPHYTES		
Polypodiaceae	<i>Polypodium diversifolium</i> Willd.	Prom., Kent, King.
SPERMATOPHYTES		
Gramineae	<i>Dichelachne crinita</i> (L.f.) Hk.	Prom., Kent, King.
"	<i>Poa poaeformis</i> (Labill.) Druce (syn. <i>P. Billardieri</i> Steud.)	Prom., Kent, King.
Liliaceae	<i>Dianella laevis</i> R.Br.	Prom., Kent, King.
"	<i>Bulbine bulbosa</i> (R.Br.) Haw.	Prom., Kent.
Orchidaceae	<i>Thelymitra aristata</i> Lindl.	Prom., Kent, King.
Casuarinaceae	<i>Casuarina stricta</i> Ait.	Prom., Kent.
Polygonaceae	<i>Muehlenbeckia adpressa</i> (Labill.) Meisn.	Prom., King.
Chenopodiaceae	<i>Rhagodia buccata</i> Moq.	Prom., King.
"	<i>Salicornia australis</i> Sol.	Prom., King.
Aizoaceae	<i>Diaphyna australis</i> (Sol.) J. M. Black	Prom., Kent, King.
"	(syn. <i>Mesembryanthemum australe</i> Sol.)	
"	<i>Tetragonia implexicoma</i> Hk.f.	Prom., Kent, King.

		Distribution.
Ranunculaceæ	<i>Clematis microphylla</i> DC.	Prom., King.
Cruciferae	<i>Lepidium foliosum</i> Desv. (syn. <i>L. ruderale</i> F.v.M., non L.)	Kent, King, also Flinders.
Rosaceæ	<i>Acacia anserinifolia</i> (Forst.) Dom. (syn. <i>A. Sanguisorba</i> (L.f.) Vahl.)	Prom., Kent, King.
Leguminosæ	<i>Acacia rhetinodes</i> Schlechtendal . .	Prom., also Flinders.
"	* <i>Albizzia distachya</i> (Vent.) Mac- bride—"Cape Leeuwin Wattle" (syn. <i>A. lophantha</i> Benth.)	Kent (1884).
"	<i>Pultenaea daphnoides</i> Wendl. . . .	Prom., Kent.
Geraniaceæ	<i>Pelargonium australe</i> Willd. . . .	Prom., Kent, King.
Rutaceæ	<i>Correa alba</i> Andr.	Prom., King.
Sapindaceæ	<i>Dodonaea viscosa</i> Jacq.	King.
Malvaceæ	<i>Lavatera plebeja</i> Sims	King, also Hogan.
Thymelæaceæ	<i>Pimela spathulata</i> Labill. (<i>P. involucreata</i> B. et Sol. form)	Prom., Kent, King.
Myrtaceæ	<i>Eucalyptus bicostata</i> Maidl. Blakely et Simon.	Prom., King.
"	* <i>E. sp. (obliqua?—no fruits)</i>	Prom.
"	<i>Melaleuca armillaris</i> Sm.	—
Umbelliferae	<i>Apium australe</i> Thou. (syn. <i>A. prostratum</i> Labill.)	Prom., Kent, King.
Epacridaceæ	<i>Leucopogon parviflorus</i> Lindl. . . .	Prom., Kent, King.
Apocynaceæ	<i>Alyxia buxifolia</i> R.Br.	Prom., King.
Solanaceæ	<i>Solanum aviculare</i> G.Forst.	Prom., King.
Myoporaceæ	<i>Myoporum insulare</i> R.Br.	Prom., King.
Rubiaceæ	<i>Gallium australe</i> DC.	Prom.
Caprifoliaceæ	<i>Sambucus Gaudichaudiana</i> DC. . .	Prom., King.
Campanulaceæ	<i>Wahlenbergia quadrifida</i> (R.Br.) DC. [?]	Prom., Kent, King.
Goodeniaceæ	<i>Goodenia orata</i> Sm.	Prom., Kent.
Stylidiaceæ	<i>Stylidium graminifolium</i> Swartz . .	Prom.
Compositæ	<i>Olearia Gunniana</i> Hk.f.	Prom., Kent, King.
"	<i>Helichrysum bracteatum</i> (Vent.) Andr., var. <i>albidum</i> DC.	Prom., Kent.
"	<i>Senecio latus</i> Forst.	Prom., Kent, King.
"	* <i>Senecio oleraceus</i> L.	Prom.

ZOOLOGY IN VICTORIA

Several meetings have been held recently with the object of reviving the Royal Zoological and Acclimatisation Society of Victoria. This body, one of the oldest in the country—it was launched in the early 1860's—has been somewhat lethargic of late, and its officers have been seeking methods of stimulating it into active and useful service. Among the proposals is one aiming at association with the Field Naturalists' Club of Victoria, and to this end the Zoological Society resolved at its last meeting to seek a conference with the F.N.C.

One of the delegates appointed by the Zoological Society was Mr. W. H. Nelson, Director of the Melbourne Zoo, who had taken an active part in attempting to revive the organization. Unfortunately, Mr. Nelson died on May 25. His passing is keenly regretted by all who were associated with him and knew his worth.

MORE ABOUT VOCAL MIMICS

By A. H. CRISHOLM

Since the publication of my article on "The Riddle of Vocal Mimicry" in the *Vic. Nat.* last year, and the subsequent publication of the material (revised and amplified) in a booklet entitled *Nature's Linguists*, several interesting letters have been received.

Mrs. Kirk, of Jarvis Creek, via Tallangatta (Vic.), who as Miss Kathleen Conway used to write many informative nature notes, reports that the wild Black-barked Magpie whose mimicry she commented upon several years ago is still alive and still frequents its old area, sometimes flying right up to the house for food. This bird, a male, indulges in mimicry most often on a wet or windy day, and usually does so while sitting low down in the heart of a tree. All the mimicry is rendered in a minor key. He does not appear to have increased his vocabulary in recent years, but, on the other hand, he has not forgotten the sounds learned years ago. The neigh of a horse and the bark of a dog-fox are still done perfectly, and the imitation of the "laughter" of a Kookaburra is quite good. In addition, he renders many bird-calls.

From Mr. E. A. R. Lord, of Murphy's Creek, Queensland, come two additions to the list of mimics, namely, the Striated Thornbill (an earlier suspect) and the little-known Buff-breasted Scrub-Wren. The Thornbill was heard imitating the calls of the Yellow Robin, and the Scrub-Wren has been known to mimic, in a whisper-song, the calls of several other small birds.

Mr. Lord adds that he recently heard a young Pied Butcher-bird rendering imitations, and on one occasion he heard no fewer than four birds of this species (two adults and two young) singing in an undertone and imitating between them a large number of bird-notes, including those of two nocturnal callers, the Boobook Owl and the Owlet-Nightjar.

Another mimic for which Mr. Lord has much admiration is the tiny Mistletoe-bird. His experience indicates that only the male bird mimics and that in some instances the imitations are extensive and remarkably faithful. The performances are rendered when the bird is resting and no other member of the species is present.

A remarkable example of the mimetic power of the Spotted Bower-bird is furnished by Miss D. McCulloch, of Pennant Hills, N.S.W. She says that when staying at the home of her sister (Mrs. Seton) near Clermont, central Queensland, she stayed in the house on one occasion when her sister and two daughters went picnicking, the arrangement being that one of them should return for her some time later. Soon afterwards she was surprised to hear the voices of the mother and two girls below the balcony—Mrs. Seton's voice soothing and explaining; Helen's slightly falsetto and rather aggrieved; Mary's deeper and a little petulant.

Apparently all were talking together, as was their way. But when Miss McCulloch went outside to meet them, all she saw was "Spotty," sitting in the mulberry-tree and rendering the voices which he had heard during his visits to the house!

Another instance of a wild bird imitating the human voice is reported by Mrs. H. Curtis (Miss Hilda Geissmann), of Tamborine Mountain, Queensland. Moreover, she adds the sub-tropical Rufous Thrush, a jungle dweller with a rich voice, to our list of mimics, so bringing the total (including some few "doubtfuls") to 52 species. Here is Mrs. Curtis's letter:—

"Talking of bird mimics: About four weeks ago I had a quite new example from our old Satin Bower-bird in the paddock. I was gardening and some boys from the college at Eagle Heights came along the road shouting and laughing. When near our farm one of the boys let out a couple of screams—some sky-larking or other was going on. Instantly the boy screamed the Satin-bird mimicked him. It was extremely funny. The bird's voice was much less in volume but a perfect imitation in pitch of sound and time. That was the first time I had heard the Satin-bird mimic a human. This bird is very old. The bower has been kept going in our paddock ever since I have lived here, and I believe it is the same male bird, though I have no feather markings or anything but the wonderful mimicry to go on. He is a handsome black bird and often is heard giving his various borrowed songs and calls. Calls of the Grey Goshawk and the screaming chicken are prime favourites, also the 'Eat you, eat you' of the Crested Hawk and the call of the Chillawong.

"Speaking of the Chillawong mimicking the 'Chip-chip,' I think that 'chip-chip' is part of their own true notes. Our Chillawongs always say 'Chip-chip-chil-a-wong, Ka-wok-Ka-wok-karr' among their many calls. I love the old Chillawongs. There used to be so many of them, but now, alas, we seldom hear one. They had a price placed on their heads by the Council and it was the cause of many hundreds being destroyed.

"Our list of the birds that mimic, taken in the order they are in your booklet (that is, the ones I have heard mimicking) is: Lyre-bird, Satin Bower-bird, Black-nest Bird (Scrub-Wren), Silvereye, Oriole, Grey Butcher-bird, Pied Butcher-bird, Whip-bird, White-browed Scrub-Wren, Large-billed Scrub-Wren.

"I should also add the Red Thrush. This bird can mimic. One against the house here learned to whistle the way I whistled for the dog in the evening. I always feed the dog after our tea at night and used to whistle five times (always the same) when I wanted him for his tea. The bird evidently heard me and was impressed with the sound on the silence of the night. He can whistle this exactly as I do, only in a richer, purer tone than I could hope to use. It is not a natural call with the Red Thrush."

VARIOUS OBSERVATIONS

By EDITH COLEMAN, Blackburn, Victoria.

Autumn Bird-orchid

Visiting the Healesville colonies of the Autumn Bird-orchid (*Chiloglottis reflexa*) on April 20, I found more flowers than I have ever seen, but so little leaf-development that the orchids were not easily discovered, although the colonies have extended. The ground under the trees was unusually dry for April. Apparently vigorous leaf-development is made at the expense of flowers. One sees this in the garden. By starving a leafy plant which refuses to flower, one often has surprising results.

Wedge-tailed Eagle

Driving to Healesville on April 20 we saw a large Wedge-tailed Eagle circling over a flock of sheep at Yering—the most "aero-plane-like" bird in flight I have seen. We stopped to watch its beautiful movement as it circled with motionless wings. We watched it spiral down, apparently right among the sheep. As it caused no commotion among them, we concluded that they were more scattered than appeared from the road, and that the eagle had dropped down to a dead sheep. We waited for some time (in skylark country, too) but saw no sheep move.

As no farmer appeared, to interfere, one assumes that the owner of the sheep has weighed the eagle's doings, good and evil. Apart from its usefulness as a carrion-feeder, in natural conditions the eagle doubtless served not only to check a too rapid increase in the species on which it preyed, but to eliminate the unfit, ultimately benefiting the species by weeding out the weak, leaving the wary and the swift.

Flocking of Mudlarks

We have always regretted the loss of any of our trees, for they have brought so many interesting birds about us. Our greatest loss was a tall messmate on land close to our own. Like the tall messmate we lost a few years ago, this was a landmark for miles around. Here for some years (in May) we had watched a great gathering of mudlarks which settled in the messmate, apparently resting for the night before resuming their journey early next morning. They settled at 5 p.m., streaming out a few times, like the swallows, before finally settling down. As they wheeled and turned their breasts caught the setting sun and turned to a lovely rose colour. They might then have been galahs. Sometimes they gathered among our own trees, but the tall messmate was their Mecca. As soon as they arrived I would walk over to that tree, sure of finding them there. My last date was May 16th, 1942.

Autumn Play Among Birds

At Healesville I found "play" in full swing among the birds. On a luscious green lawn nine blackbirds were playing hide-and-seek among the shrubs while they foraged for ground food, which seemed abundant.

At the Melbourne Botanic Garden (19/4/45) I noticed a male blackbird with a white feather which made him very conspicuous. Was it a coincidence that he skulked under cover of bushes while I watched, coming out only when I pretended to leave? He was one of a "triangle" but the other two (male and female) made no attempt to hide. At Healesville on April 23 I saw another male blackbird with quite a patch of white on one wing. He, too, took cover as if aware that he had lost any "cloak of invisibility" he may have possessed.

Clustering of Wood-Swallows

My last record of the Dusky Wood-Swallows was Feb. 27, 1945 (*V.N.*, April, 1945). I did not see them again until Feb., 1946. They were back in the "paddock" on Feb. 16, but I did not see them cluster.

Feb. 17th, 1946: Commenced to cluster at 7.10 p.m. and had settled at 7.30 p.m. after streaming out a few times.

Feb. 18th: Raining heavily. I did not go out.

Feb. 19th: A small cluster had settled high up in a leafy top at 7.30 p.m.

Feb. 20th: A much larger cluster at 7.30. A few stragglers came later.

Feb. 21st: I rose at 20 to 5 a.m. and found that the birds had gone. Sky still moon-lit but not light enough, I thought, for them to fly. I was glad when the dogs gave notice of my whereabouts and a member of the family appeared who confirmed my decision. No other birds stirring. In the evening there was no sign of them at 7.20, or later. They may have come in earlier and settled in another tree, but it was too dark to discover them and there were no bed-time sounds to guide me. I did not see them again until April 5th, when a large swarm settled near the house. I watched them cluster on the 6th, 7th and 8th, a little earlier each evening.

April 9th: The glow of setting sun caught them. Had quite settled at 6.15 p.m.

April 10th: Clustered at 6.12 p.m. It was not yet dark. With a suitable camera and long exposure one might have secured a photo! They never seem to choose the most sheltered positions. This one was very exposed.

April 11th: All back at 5.45 and clustered suddenly; no movement afterwards.

April 12th: Heavy rain; bitterly cold. I did not go out.

April 13th: Heavy rain at 20 to 6. Saw no swarm even when the rain ceased, nor did I see them again until Feb., 1947.

Feb. 18th, 1947: Swarmed to-night at 7.10 for the first time, although they have been about the trees for several days.

Feb. 19th: Small swarm settled at 7.15 p.m. A few late-comers. Some of the gum-trees, including two of their favourites, had been cut down ready for building. This may have disturbed them.

Feb. 20th: Settled at 7.30 in same tree. Watched them skimming among trees for 20 minutes before settling. Beautiful sunset in which the trees stood out with a glowing sky behind. Does sunset influence the accuracy of their timing—to within a few minutes each evening?

Feb. 21st: Skimming among trees for 15 minutes, then settled in the same tree as on 19th and 20th. Something seemed to disturb them. It may have been our two small cream-coloured dogs, which in the dusk may appear like cats. The birds flew out in a stream and settled in a tree some 100 yards distant, not on our land. It was a large swarm and made much noise as they settled. We thought they returned to our trees, but were not certain.

Feb. 22nd: A very small swarm at 7.35 p.m. Many frequently flew out as if reluctant to settle and meant to roost among leafy twigs. Bitterly cold and windy. I came in for a coat and found the birds still in the same exposed situation when I returned.

Feb. 23rd: Birds skimming among the trees at 7 p.m. Had settled at 7.15, then the cluster broke and flew to the garden. Kept flying out as if hawking. Insects numerous. At 7.30 I counted 19 birds as they returned and clustered. Others came later, singly; all quiet at 25 to 8.

Feb. 24th: Warm but windy. Saw none.

Feb. 25th: Some among the trees but did not cluster. Still warm and windy.

Feb. 26th: Very warm. Many insects. Birds were beautiful skimming among trees at 7 p.m. Settled high up in favourite tree at 7.25, making much noise. These bed-time sounds are delightful. All quiet at 7.35.

Feb. 27th: Very warm. Many skimming among trees in the afternoon. No sign of them at 7.15 p.m.: Was I too late?

Feb. 28th: About 30 about trees at 7 p.m. Very hot day. A shower at 6 p.m., then mild and fresh. Small cluster in favourite fork. Skimmed out occasionally. All quiet at 7.20 p.m.

March 1st: Saw a large swarm come through and settle in neighbours' tree about 100 yards distant at 7.5 p.m. They came back later and settled in a fresh tree.

March 2nd: Away from home.

March 3rd: Birds playing among the trees but did not settle at 7.10, when I came in.

March 4th-5th: Heavy rain; did not go out.

March 6th: Saw swarm fly over our trees and settle in same tree as on March 1st. They came back later and settled, then left again for the same tree. They constituted a large cluster and made much noise.

March 7th, 8th, 9th, 10th and 11th. About the trees but did not cluster. A cricket pitch between their favourite trees, with budding but very enthusiastic cricketers, may have unsettled them.

March 12th. Cold after wet day. No cricket this evening. Large cluster near the gate in a very poor tree. Strange they don't seek closer shelter. More rain threatening, but probably they are better weather prophets than we are. All are on the east side of the stem, so are fully sheltered from the west. No movement at 7 p.m. Not yet dark. The trees are so sparsely foliated that they shut out very little light. Last appearance.

March 13th: A large band of cricketers under their trees. Birds have not returned.

The study of bird migration is fascinating, even when, as in the case of the Wood-Swallows, it is only partial. An interesting feature is their punctuality, not only in clustering at the same time each evening, but in returning to a favoured locality.

April 4th: At 9 a.m. the Wood-Swallows provided a beautiful sight as they played among rain-wet trees, dashing in and out as if bathing. Then they settled close together high up on a thin, leafless branch, all in line, tails all one way, closer together than love-birds. There was not room for all on the one branch so several groups of two or three sat on nearby twigs. They made a beautiful picture as they sat in the warm sunshine, preening and chattering. The slender branch appeared to be strangely thickened and brown, in contrast with the glistening leaves on other branches. It will be noted that the Wood-Swallows appeared on April 5th last year after a lapse of about twelve days. They have apparently clustered elsewhere if they remained in the vicinity.

A BIRD AND A NAME

A correspondent has raised the question whether the name *Lyra*, applied to a small town on the southern tablelands of Queensland, commemorates the lyrebird of the area, which is the sub-species known as Prince Edward's lyrebird, *Methura edwardi*. An old resident of the region adjusted this point some years ago.

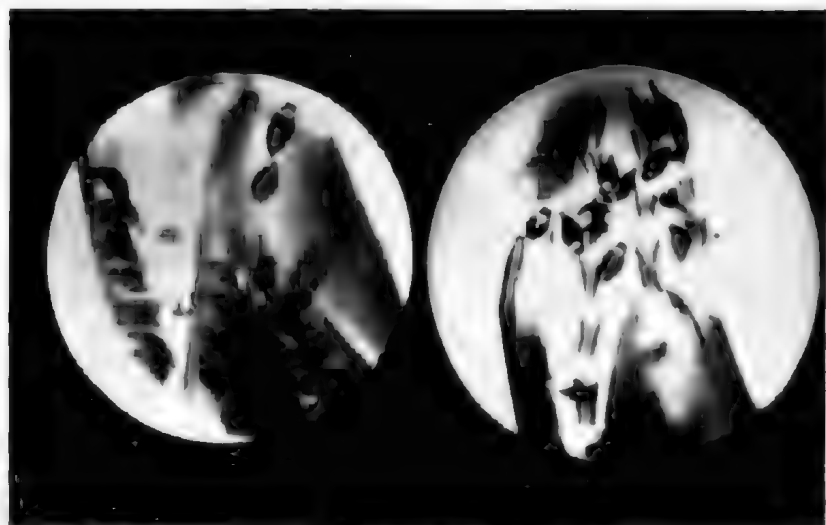
"The fact is," he said, "back in the 1890's our township used to be called Accommodation Creek. That was too much of a mouthful. Also, it took too long to write. So I went to see the Railways Commissioner about the matter. We looked through a little book devoted to aboriginal words and found that the natives' name for creek was *Lira*. 'Well,' I said, 'what about making it *Lyra*?' The Commissioner agreed, and so *Lyra* took the place of Accommodation Creek."—A.H.C.

WHAT OF THE *PLANIDIA*?

By TARLTON RAYMENT, Melbourne.

"Well, just what are Planidia?"

They are extraordinary little creatures, as I shall show you presently. I had not hitherto been fortunate enough to discover any on a bee until Norman W. Rodd sent along a very fine micro-mount of the mouth-parts.



Planidia on Maxillae (left) and Palpi (right) of a Wild Bee,
Paracolletes crassipes.

Photo-micrographs: Tarlton Rayment.

The specimens are so beautifully prepared that I could not refrain from making a photo-micrograph or two of these unusual stages of the parasites. You will see they are more or less cigar-shaped, and attached in numbers to the "tongue." The superficial aspect suggests the puparia of certain parasitic flies (see *A Cluster of Bees*, p. 547).

Rodd caught the host at Patonga Beach, but perhaps you do not know the place, so permit me to tell you that it lies directly opposite Hawkesbury, New South Wales, whence one can take a stout little launch for the beach. I know it requires a stout launch at certain seasons, for I have crossed over on a rough day.

My correspondent spends his holidays there, for it is a small but altogether delightful resort. Hunting for a few indigenous bees, Norman collected a red-legged earth-digging bee, *Paracolletes crassipes* F. Smith, and in the glissa and palpi are dozens of Planidia.

Just how the Planidia reached the mouth-parts of the bee I do not know, but I suggest that they congregate, like the legged triungulinid larvae of the "Blister Beetles," in a flower, and await the arrival of the host. I cannot, in the absence of the adults, determine the species, and they are rarely found. So far as my memory goes, this is the first record of Planidia on any Australian bee. Let us, then, award Norman Rodd full credit for his interesting discovery.

From Bugnion's work I learn that the tiny females of *Pseudogonatos liahai* have no ovipositor, and the microscopic eggs pour forth in a veritable flood. H. S. Smith, in his studies of *Perilampus* (parasitic wasps), informs us that many are as small as 0.1 mm. Some females deposit their eggs—three to four thousand of them—on the leaves of plants, and the young hatch there. (The Meloid beetles, parasites in the nests of certain wild bees, also deposit immense numbers of eggs.)

However, when a suitable host arrives, the larvae become highly excited, and attach themselves in dozens to the unfortunate wasp or bee. The young develop, and pupate *in situ*. Later they drop off, and soon after emerge as adults.

The late Professor William Morton Wheeler found many ants heavily infested with numbers of Planidia, and other authors have observed the parasites on wasps of several species. They appear to be prevalent in America, but are seldom reported in Australia.

Wheeler says the chalcid wasps, with their ovipositors, are not so primitive as Bugnion's species, and that many naturalists have observed the resemblance of hymenopterous Planidia to the triungulinid larvae of the oil or blister beetles, which also have remarkable phases of development. The young emerge from eggs, deposited on plants, and await the arrival of a host, perhaps a bee. Clutching the hairy fleece, the legged triungulins are carried off to the bee's nest, where they pass through a hyper-metamorphosis before the true legless metamorphic stage is accomplished.

REFERENCES

- Bugnion, S.: *La Structure Anatomique du Trigonalis Halmi*, Schweiz. Ent. Ges. 12, 1912.
 Høhngrén, N.: *Termitenstudien* (4 parts), 1909-13.
 Wheeler, William Martin; *Social Insects*.
 Smith, H. S.: "Chalcidoid Genus *Perilampus* and its Relations to the Problem of Parasite Introduction," *U.S. Dept. Agr. Bur. Ent., Techn. Ser.* No. 19, Pt. 4, 1916.
 Rayment, Tarlton: *A Cluster of Bees*.

ERRATA

- In *Vic. Nat.*, May 1947, p. 9, first line of last par.—For "*Conserv. and Jard.*" read *Conserv. et Jard.*
Ditto, p. 15, last line of par. 4—For "*A. aulacarpa*," read *A. aulacocarpa*.
Ditto, p. 16, second line of par. 4—For "*Erythrophlaeum, Laboucheri*," read *Erythrophlaeum Laboucheri*.

BIBLIOGRAPHY OF DR. G. B. PRITCHARD

Compiled by F. S. COLLIVER, Melbourne.

1892

1. Pritchard, *Ann. Rpt. Stth. Aust. School of Mines and Industries*, 1891, pp. 1-38. Remarks on the Tertiaries of Australia, together with a Catalogue of Fossils.
2. Pritchard—Hall and, *Proc. Roy. Soc. Vic.*, IV, (n.s.), pt. I (Apr.), pp. 9-26, pls. III-IV. Notes on the Lower Tertiaries of the Southern Portion of the Moorabool River.
3. Pritchard, *Proc. Roy. Soc. Vic.*, IV, (n.s.), pt. I (Apr.), pp. 56-58, pl. VI., On a New Species of Graptolitidae (*Tenninograptus magnificus*).
4. Pritchard, *Trans. Roy. Soc. Stth. Aust.*, 15 (2) (Dec.), pp. 179-182. On the Cambrian Rocks at Curramulka.

1894

5. Pritchard—Hall and, *Proc. Roy. Soc. Vic.*, VI (n.s.) (Jan.), pp. 1-23, pl. I. Notes on the Eocene Strata of the Bellarine Peninsula, with brief reference to other Deposits.
6. Pritchard—Hall and, *Rpt. 5th Meeting Aust. Assoc. Adv. Sci. (Adelaide)*, pp. 338-343. On the Age of Certain Plant-Bearing Beds in Victoria.

1895

7. Pritchard, *Proc. Roy. Soc. Vic.*, VII (n.s.) (Jan.), pp. 27-30. Notes on Some Landsfield Graptolites.
8. Pritchard, *Proc. Roy. Soc. Vic.*, VII (n.s.) (Jan.), pp. 157-158. Note on the Occurrence of Fossil Bones at Werribee.
9. Pritchard—Hall and, *Proc. Roy. Soc. Vic.*, VII (n.s.) (Jan.), pp. 180-196. The Older Tertiaries of Maude, with an Indication of the Sequence of the Eocene Rocks of Victoria.
10. Pritchard, *Proc. Roy. Soc. Vic.*, VII (n.s.) (Jan.), pp. 225-231, pl. XII. Contribution to the Palaeontology of the Older Tertiary of Victoria. Lamellibranchs. Pt. I.
11. Pritchard, *Geelong Naturalist*, IV, No. 3 (March), pp. 37-40. Notes on the Freshwater Limestone of the Geelong District.
12. Pritchard, *Geelong Naturalist*, IV, No. 3 (March), pp. 40-44. The Sand-dunes of the Coast.
13. Pritchard, *Proc. Mal. Soc. London*, I, No. 5 (March), p. 199. Note on *Spirulirostra*. (Abstract.)

1896

14. Pritchard, *Rpt. 6th Meeting Aust. Ass. Adv. Sci. (Brisbane)*, pp. 348-361. On the Present State of our Knowledge of the Older Tertiaries of Southern Australia.
15. Pritchard, *Proc. Roy. Soc. Vic.*, VIII (n.s.), (Apr.), pp. 74-150, pls. II-IV. A Revision of the Fossil Fauna of the Table Cape Beds, Tasmania, with Descriptions of the New Species.
16. Pritchard—Hall and, *Proc. Roy. Soc. Vic.*, VIII (n.s.) (Apr.), pp. 151-168. Remarks on the Proposed Sub-Division of the Eocene Rocks of Victoria.

1897

17. Pritchard—Hall and, *Proc. Roy. Soc. Vic.*, IX (n.s.) (March), pp. 187-229, pl. VIII. A Contribution to our Knowledge of the Tertiaries in the Neighbourhood of Melbourne.
18. Pritchard—Hall and, *Proc. Roy. Soc. Vic.*, X (n.s.), pt. I (July), pp. 43-56, pls. I-II. Geology of the Lower Moorabool.

19. Pritchard—Hall and, *Proc. Roy. Soc. Vic.*, X (n.s.), pt. I (July), pp. 57-59. Note on a Tooth of *Palarchestes* from Beaumaris.

1898

20. Pritchard and Gatliff, *Proc. Roy. Soc. Vic.*, X (n.s.), pt. II (May), pp. 140, 141. On a New Species of Victorian Mollusc. (*Corallio-philus wilsoni*.)
21. Pritchard and Gatliff, *Proc. Roy. Soc. Vic.*, X (n.s.), pt. II (May), pp. 236-284. Catalogue of the Marine Shells of Victoria. Part I.
22. Pritchard, *Proc. Roy. Soc. Vic.*, XI (n.s.), pt. I (Sept.), pp. 96-111, pls. VII-VIII. Contributions to the Palaeontology of the Older Tertiary of Victoria. Gastropoda. Part I.

1899

23. Pritchard and Gatliff, *Proc. Roy. Soc. Vic.*, XI (n.s.), pt. II (Feb.), pp. 179-184, pl. XX. On Some New Species of Victorian Mollusca.
24. Pritchard and Gatliff, *Proc. Roy. Soc. Vic.*, XI (n.s.), pt. II (Feb.), pp. 185-208. Catalogue of the Marine Shells of Victoria. Part II.
25. Pritchard—Hall and, *Proc. Roy. Soc. Vic.*, XII (n.s.), pt. I (Aug.), pp. 36-58, pl. VI. The Tertiary Deposits of the Aire and Cape Otway.
26. Pritchard and Gatliff, *Proc. Roy. Soc. Vic.*, XII (n.s.), pt. I (Aug.), pp. 100-106, pl. VIII. Some New Species of Victorian Mollusca.
27. Pritchard, *Proc. Roy. Soc. Vic.*, XII (n.s.), pt. I (Aug.), pp. 112-114, pl. IX. On the Occurrence of *Diprotodon australis* (Owen) near Melbourne.

1900

28. Pritchard and Gatliff, *Proc. Roy. Soc. Vic.*, XII (n.s.), pt. II (Apr.), pp. 170-205. Catalogue of the Marine Shells of Victoria. Part III.
29. Pritchard, *Vict. Nat.*, XVII, No. 3, p. 55. (5-7-'00); Note on a New Name for a Victorian Marginella.
30. Pritchard and Gatliff, *Proc. Roy. Soc. Vic.*, XIII (n.s.), pt. I (Aug.), pp. 131-138, pls. XX, XXI. On Some New Species of Victorian Mollusca. Part 4.
31. Pritchard and Gatliff, *Proc. Roy. Soc. Vic.*, XIII (n.s.), pt. I (Aug.), pp. 139-156. Catalogue of the Marine Shells of Victoria. Part IV.
32. Pritchard, *Proc. Roy. Soc. Vic.*, XIII (n.s.), pt. I (Aug.), pp. 157-174. On the Nomenclature of Geological Age.

1901

33. Pritchard, *Vict. Nat.*, XVIII, No. 4, pp. 61-63 (8-8-'01); Eocene Deposits at Moonee Ponds.
34. Pritchard, *Vict. Nat.*, XVIII, No. 4, pp. 63-65. (8-8-'01); On a New Zeolite (Mooraboolite).
35. Pritchard, *Proc. Roy. Soc. Vic.*, XIV (n.s.), pt. I (Aug.), pp. 22-31, pls. II-III. Contributions to the Palaeontology of the Older Tertiary of Victoria. Lamellibranchs. Part II.
36. Pritchard—Hall and, *Proc. Roy. Soc. Vic.*, XIV (n.s.), pt. I (Aug.), pp. 32-54, pl. IV. Some Sections Illustrating the Geological Structure of the Country about Morrongton.

1902

37. Pritchard—Hall and, *Proc. Roy. Soc. Vic.*, XIV (n.s.), pt. II (Apr.), pp. 75-81. A Suggested Nomenclature for the Marine Tertiary Deposits of Southern Australia.
38. Pritchard and Gatliff, *Proc. Roy. Soc. Vic.*, XIV (n.s.), pt. II (Apr.), pp. 85-138. Catalogue of the Marine Shells of Victoria. Part V.
39. Pritchard and Gatliff, *Proc. Roy. Soc. Vic.*, XIV (n.s.), pt. II (Apr.), pp. 180-184. On Some New Species of Victorian Mollusca. No. 5.

40. Pritchard, *Vic. Nat.*, XIX, No. 1, pp. 14-15 (8-5-'02). Mollusca (of The Shoreham Campout).
41. Pritchard, *Vic. Nat.*, XIX, No. 1, pp. 17-20 (8-5-'02). Mineralogy (of The Shoreham Campout).
42. Pritchard, *Vic. Nat.*, XIX, No. 8, p. 111 (4-12-'02). Mollusca (of The Shoreham Campout).
43. Pritchard, *Vic. Nat.*, XIX, No. 8, p. 114 (4-12-'02). Mineralogy (of The Shoreham Campout).

1903

44. Pritchard, *Vic. Nat.*, XIX, No. 10, pp. 142-144 (5-2-'03). Geology of Flinders.
45. Pritchard, *Proc. Roy. Soc. Vic.*, XV (n.s.), pt. II (Feb.), pp. 87-103, pls. XII-XV. Contributions to the Palaeontology of the Older Tertiary of Victoria. Lamellibranchs, Part III.
46. Pritchard and Gatliff, *Proc. Roy. Soc. Vic.*, XV (n.s.), pt. II (Feb.), pp. 176-223. Catalogue of the Marine Shells of Victoria. Part VI.
47. Pritchard, *Proc. Roy. Soc. Vic.*, XVI (n.s.), pt. I (Sept.), pp. 83-91, pls. XIII-XIV. On Some Australian Tertiary Pleurotomarias.
48. Pritchard and Gatliff, *Proc. Roy. Soc. Vic.*, XVI (n.s.), pt. I (Sept.), pp. 92-95, pl. XV. On Some New Species of Victorian Mollusca; also Observations on our Commonest Species of *Chione*, together with figures of same.
49. Pritchard and Gatliff, *Proc. Roy. Soc. Vic.*, XVI (n.s.), pt. I (Sept.), pp. 96-139. Catalogue of the Marine Shells of Victoria. Part VII.

1904

50. Pritchard—Hall and, *Proc. Roy. Soc. Vic.*, XVI (n.s.), pt. II (Mar.), pp. 292-305, pl. XXVI. Geology of the Barwon about Inverleigh.
51. Pritchard and Gatliff, *Proc. Roy. Soc. Vic.*, XVII (n.s.), pt. I (Sept.), pp. 220-266. Catalogue of the Marine Shells of Victoria, Part VIII.
52. Pritchard—Chapman and, *Proc. Roy. Soc. Vic.*, XVII (n.s.), pt. I (Sept.), pp. 267-297, pls. XI-XII. Fossil Fish Remains from the Tertiaries of Australia. Part I.
53. Pritchard, *Proc. Roy. Soc. Vic.*, XVII (n.s.), pt. I (Sept.), pp. 320-337, pls. XVIII-XIX. Contributions to the Palaeontology of the Older Tertiary of Victoria. Gastropoda. Part II.
54. Pritchard and Gatliff, *Proc. Roy. Soc. Vic.*, XVII (n.s.), pt. I (Sept.), pp. 338-339, pl. XX. On Some New Species of Victorian Mollusca. No. 7.

1906

55. Pritchard and Gatliff, *Proc. Roy. Soc. Vic.*, XVIII (n.s.), pt. II (Feb.), pp. 39-92. Catalogue of the Marine Shells of Victoria. Part IX. With Complete Index to the Whole Catalogue.
56. Pritchard, *Vic. Nat.*, XXII, No. 12, pp. 207-212 (5-4-'06). Conchology of Excursion to Wilson's Promontory.
57. Pritchard, *Vic. Nat.*, XXII, No. 12, pp. 219-223 (5-4-'06). Geological Notes (of) Excursion to Wilson's Promontory.
58. Pritchard, *Vic. Nat.*, XXIII, No. 6, pp. 117-120 (4-10-'06). Some Palaeontological Notes.

1907

59. Pritchard, *Vic. Nat.*, XXIII, No. 11, pp. 197-203 (7-3-'07). Geology and Palaeontology. Lecture given at the Murrumbidgee Camp. (Printed simultaneously as a Supplement to the *Education Gazette and Teachers' Aid*. Education Department Publication, Victoria.)
60. Pritchard—Chapman and, *Proc. Roy. Soc. Vic.*, XX (n.s.), pt. I (Aug.), pp. 59-75, pls. V-VIII. Fossil Fish Remains from the Tertiaries of Australia. Part II.

1908

61. Pritchard, *Proc. Roy. Soc. Vic.*, XXI (n.s.), pt. I (Aug.), pp. 392-400, pls. XXII-XXIII. On the Occurrence of the Genus *Litina* in Victoria, with Description of a New Species.

1909

62. Pritchard, *Vic. Nat.*, XXVI, No. 2, p. 20 (10-5-'09). Excursion to Williamstown and Altona Bay.
63. Pritchard, *Vic. Nat.*, XXVI, No. 2, pp. 20-24 (10-6-'09). The Recent Shell-Beds of Williamstown.

1910

64. Pritchard, *Proc. Roy. Soc. Vic.*, XXII (n.s.), pt. II (Apr.), pp. 225-262. On the Bacchus Marsh Sandstones and their Fossils.
65. Pritchard, *The Geology of Melbourne*; pp. 187; 44 illustrations. (Dec.). Published by Peter G. Tait, Melbourne.

1912

66. Pritchard, *Age* newspaper (25-5-'12). The You Yangs. What are they?

1913

67. Pritchard, *Proc. Roy. Soc. Vic.*, XXV (n.s.), pt. II (Mar.), pp. 363-364, pl. XXIX. On a New Silurian Bivalve from the Lilydale Quarries. *Lucina (ProLucina) mitchelli*.
68. Pritchard and Garliff, *Proc. Roy. Soc. Vic.*, XXVI (n.s.), pt. I (29-9-'13), pp. 63-66, pl. VII. On *Natica tasmanica*, Tension-Woods, and Description of a New Species of *Natica*.
69. Pritchard, *Proc. Roy. Soc. Vic.*, XXVI (n.s.), pt. I (29-9-'13), pp. 192-201, pls. XX-XXI. A Revision of the Fossil Volutes of the Table Cape Beds, Tasmania, with Descriptions of New Species and Varieties.

1915

70. Pritchard, *Rpt. Brit. Ass. Adv. Sci.*, 84th Meeting, Australia, 1914, p. 374 (Ref. 120). (Discussion) On the Age and Sequence of the Victorian Tertiaries.

1925

71. Pritchard, *Proc. Pan-Pacific Sci. Cong.* (Aust., 1923), Art. 57, pp. 934-939. The Character and Sequence of the Victorian Tertiaries.

1928

72. Pritchard, *Journal of Proceedings of the Royal Victorian Institute of Architects*, XXVI, No. 3 (July), pp. 107-112. Building Stones and their Weathering.

1931

73. Pritchard, *Bonkers' Magazine of Australia*, Vol. 45, No. 4 (30-11-'31), pp. 55-58. Oil in Australia.

1939

74. Pritchard, *Vic. Nat.*, LV, No. 9, pp. 151-159, 4 text figs. (4-1-'39). On the Discovery of a Fossil Whale in the Older Tertiaries of Torquay, Victoria.
75. Pritchard, *Proc. Sixth Pan-Pacific Sci. Cong.* (San Francisco), pp. 523-526. The Tertiaries of Australia.

1944

76. Pritchard, *Old Yarra History*, as told by the Geology of Burnley, Heyington, Tooronga (with appendix 'A New Fossil from Auburn, *Euomphalus holzeri*, sp. nov.'), pp. 1-32. Published by F. W. Cheshire, Melbourne.

Dr. Pritchard has reported on the following matters also: Oil, gold, arsenic, nickel, molybdenum, osmiridium, hauvite, sands, clays, limestones, granites, basalts, bricks, tiles, firebricks, pigments, etc., but unfortunately it has not been possible to trace any of these as published records.

The Victorian Naturalist

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No. 763

PROCEEDINGS

The Annual Meeting of the Club was held on June 9, 1947, at the Lecture Hall, Melbourne Public Library, the President (Mr. F. S. Colliver) and about 150 members and friends attending. The Annual Meeting was preceded by a brief special meeting to consider an alteration to Rule 11, providing for three additional offices, viz., Asst. Treasurer, Asst. Editor, and Excursion Secretary. This alteration was moved by Mr. H. C. E. Stewart, seconded by Mr. G. Coghill and carried without dissent.

A letter nominating Mr. F. Lewis for the Australian Natural History Medallion was noted, also one from Mr. E. J. Cope relating to a change of rule (already under consideration in committee) and from the A.N.Z.A.A.S., inviting the Club to send delegates to the Perth meeting in August. The delegates appointed to visit Perth were Prof. J. S. Turner, Dr. R. T. Patton and Mr. P. F. Morris. Letters of protest from the Club had been sent to the press and to the A.B.C. concerning reports that a wedge-tailed eagle was shot by an archer—the daily press and radio had implied applause of this unfortunate incident.

The following were elected as Ordinary Members of the Club: Dinkar Kherdekar, Esq., and Mr. H. Chapman.

ANNUAL REPORT AND BALANCE SHEET

The Hon. Secretary read the Annual Report, which was received on the motion of Messrs. P. F. Morris and L. W. Cooper. After a short discussion the adoption was moved by Mr. P. C. Morrison, seconded by Mr. A. S. Chalk and carried.

The financial statement was read by Mr. A. G. Hooke, who, as auditor, moved the adoption. This was seconded by Mr. A. S. Chalk and carried without discussion.

At this juncture the President arose to retire from office in favour of the in-coming President. He stated that he did so feeling it a most important occasion, for the first lady President in the Club's 67 years' existence was about to take office. Mr. Colliver warmly thanked the committee and members for their assistance during his term of office; he looked for the same help and co-operation to be shown the new President, Miss Ina Watson, who was then invited to take the chair and continue with the election of office-bearers.

In a few words, Miss Watson thanked members for the honour she had received in being chosen to represent them and their ideals. As sufficient nominations, and no more, had been received for the vacant offices, she had pleasure in declaring those officers duly elected. (See inside back cover for list.)

For committee a ballot was necessary, resulting in the choice of: Mrs. J. J. Freame, Messrs. G. N. Hyam, Ivo C. Hammet, R. D. Lee and Colin Lewis. Mr. H. C. E. Stewart retained his previous position as Immediate Past President, allowing the committee to retain a full personnel.

The new President announced that, during the evening, donations of £50 had been received from Miss H. Bowie, £5/5/- from Mr. Geo. Coghill, and two amounts of £1/1/- as donations from Honorary Members.

Mr. F. S. Colliver's address as retiring President concerned "Birds of the Past." The principal fossil forms from each Age were mentioned, and exemplified by the epidiascope and by fossil specimens.

EXHIBITS

Miss Helen Kniep: Red and white forms of *Templetonia retusa* from Western Australia.

Mr. V. H. Miller: Obsidian and other rocks from Mayor Island, pumice from New Zealand, and butterflies from New Guinea (specimens collected by Major T. H. Brunn).

Mr. C. J. Gabriel: Land shells with egg (*Paryphanta bushbyi* Gray, from N.Z., and *Chorapa albanensis* Cox, from Kinglake).

Mr. F. S. Colliver: Moa bones from New Zealand, including *Dinornis maximus*, *Euryapteryx gravis*, and *Emeus crassus*.

SIXTY-SEVENTH ANNUAL REPORT

The membership has grown steadily during the last few years, the present year closing with 585 financial members, comprising 373 Ordinary Members, 165 Country Members, 32 Associates, 13 Honorary and two Life Members—an increase of 82 over the 503 recorded in our last annual report. It is interesting to record that our membership now extends as far afield as India.

With sorrow we record the death of Mr. John Ingrani, a member since 1926 and one-time Honorary Treasurer. Among other well-known naturalists and friends of the Club whose passing is regretted are: the wife of Mr. George Coghill (now an Honorary Member and Past President); the Rev. George Cox, for so long a familiar figure in the activities of the Mornington Naturalists' Club; and, more recently, Associate Professor F. A. Singleton.

The continued expansion of membership has brought with it additional problems, in arranging for adequate seating accom-

modation and in exhibit space for those who attend the monthly general meetings. The trustees of the Museum and Public Library have been very helpful in providing seats for what has been an average attendance of about 200, and we offer them our thanks.

Although a very important feature of meetings, the exhibits staged during the year have not been adequately provided for, but the Museum authorities are gradually doing what they can to improve the lighting in that part of the hall used for our exhibits. When this is done, more exhibit tables can be used. It is felt that many exhibits have been sufficiently important and interesting to warrant something more than a mere mention. The Editors would welcome instructive or informative notes concerning them: an account of their nature and the reason prompting their display can thus become a permanent record of some phase of natural history.

Despite our now large membership, it is still a matter of some difficulty to obtain suitable material for the *Naturalist*. The standard of the war years has been maintained and, with the co-operation of members, can be further improved. Our journal has now an almost world-wide circulation—scientific bodies in France, Russia and Sweden having been recently added to the mailing list. Members should strive to ensure that it remains the leading natural history journal in Australia. Volume 63 has been completed and the Index is now available.

Many members regularly attend also the Group meetings. Of the three Groups already established, those concerned with botany and geology are proving popular and are evidently fulfilling a definite need. Their success has brought a number of requests for the formation of a Zoology Group whose activities may be expected to embrace marine biology and, possibly, entomology. Shortage of photographic material has undoubtedly restricted the extension of membership of the Photographic Group. The work being done by its members in building up the Club's library of natural history photographs is praiseworthy.

Within the Botany Group, which meets at the Royal Society's Hall on the evening of the fourth Monday each month, it is hoped that sections will soon be formed to undertake definite projects for improving our knowledge of the nearer National Parks and Forest Reserves. Mr. Swaby reports that the Record of Research has made little progress. Possibly members misunderstand its purpose. Any new investigation breaking new ground, however small, is entitled to entry and requests for specimens or other forms of assistance will be duly published.

The Geology Group has undertaken a planned study of coast-line erosion, as it is occurring at Black Rock, and it is hoped that this will be the forerunner of more such useful projects. At the suggestion of Mr. Elford, use of the mineral laboratory at the

National Museum has been granted to members of the group through the courtesy of the Director (Mr. R. T. M. Pescott) and the Mineralogist (Mrs. Whineup). Members are also grateful to Mr. H. Preston for his gift of a set of apparatus for chemical analysis. This group also meets at the Royal Society's Hall, on the first Tuesday each month.

In addition to the Excursions (now made permanent) and Plant Names Sub-committees—which latter reports the revision of more than half the flora of Victoria—three further sub-committees have been set up during the year. That on Maranoa arose out of the Club's special excursion to those gardens last February. At the request of the honorary secretary of the Camberwell Council's Maranoa Gardens' Committee, our sub-committee, consisting of Messrs. A. J. Swaby, I. Hammet and E. Lord, was appointed to assist and advise on matters affecting general welfare.

A Heathland Flora Reserve Sub-committee has been formed to examine the possibility of having permanently reserved as a *natural* park some portion of our fast-vanishing bayside heathlands. That on National Monuments, convened by Mr. G. N. Hyam, revives a body which was allowed to lapse during the war. Briefly, its purpose is to study ways and means of improving and developing Victoria's national parks and, ultimately, to submit recommendations for the control of *all* our national monuments under one properly constituted authority.

Your committee is of opinion that the work of these sub-committees will be made much more effective by the active interest of Club members, whose suggestions and advice will be both welcome and encouraging:

The existing national parks of the State have received attention during the year and your committee has been of some assistance to Mr. and Mrs. Eric Muir and the people of the Shire of Dimboola in their successful move to establish such a park at Dimboola. The interests of Mt. Buffalo National Park have been watched, especially in relation to the effects of forest grazing. At the Royal Commission of Enquiry, our Past President (Mr. H. C. E. Stewart), together with Mr. A. D. Hardy, was able to offer some pertinent evidence. The committee is now occupied in furthering the aims of Messrs. N. Learmonth, J. Jones, and their associates of the Portland F.N.C., who are working for the reservation of a tract of country on the lower reaches of the Glenelg River.

The Australian Nature Show was again held at the Hawthorn Town Hall last October: it attracted large attendances and was worthy of Club traditions. Your committee would here like to thank all those who organized, arranged and finally dismantled the show under what were, unfortunately, difficult circumstances, viz., the coincidence of a railways' strike. The Club also arranged

a display at an exhibition held by the Hawthorn District Boy Scouts' Association on May 24 last. The exhibits attracted much interest, and particular credit is due to those of our group members who made it such a success.

The Victorian Council of Scientific Societies has held regular meetings during the year, and Mr. J. H. Willis has acted as F.N.C. representative. Meetings of the Australian and New Zealand Association for the Advancement of Science were revived last August in Adelaide and our official delegate on the Council was Mr. F. S. Colliver. The F.N.C.V. is entitled to nominate three delegates to the A.N.Z.A.A.S. Council. Since our policy in relation to the conservation of wild life and primitive areas is worth bringing to the notice of such an influential body, Professor J. S. Turner, Dr. R. T. Patton and Mr. P. F. Morris have been invited to act as the Club's official delegates to the forthcoming meeting at Perth next August.

The Australian Natural History Medallion for 1946 was awarded to Mr. Heber Longman, formerly Director of the Queensland Museum and noted for his work on Australian vertebrate palaeontology. Following its announcement of the award, the Selection Committee made a number of important recommendations governing the rules of procedure for dealing with future awards; it is anticipated that these will be adopted at the next meeting of the Award Committee.

With regard to your own committee, one special meeting and nine ordinary meetings have been held during the year. The large volume of work dealt with in committee can be gauged from the following resumé of those of its activities not already discussed.

Regular reports on the junior branches of the Club at Hawthorn and Toorak are received monthly, and to all concerned with the active functioning of these branches the Club offers its thanks. A possible junior branch at Thornbury is also being discussed. Progress of the Burnley Wild Life Club has also been kept before the committee, which, early in the year, offered prizes for the best essays on a natural history subject by members of that club. Awards, which took the form of a one-year subscription to F.N.C.V., went to Miss Elspeth Newman—one of our own members—for her essay on "Common Victorian Terrestrial Orchids" and to Mr. G. H. Fetherstone for his "Naturalists' Paradise."

Revival of the Ararat Field Naturalists' Club, which went into recess during the war, has been followed with active interest. Under the leadership of Mr. Stewart, an excursion to the Grampians, in conjunction with the Ararat club, was undertaken last spring and it is felt that this event did much to revive and extend interest in the country club.

The committee's official excursion to Nelson and the Lower Glenelg River last Easter was undertaken with the double object of examining the potentialities of this area as a national park and maintaining contact with the Portland Field Naturalists' Club. An unofficial excursion to Bendigo, late in April last, served to keep us in touch with the Bendigo Field Naturalists' Club.

As the centenary of the arrival in Australia of Baron von Mueller occurs next December, your committee followed up the move initiated by the Director of the Botanic Gardens for the issue of commemorative postage stamps to honour the great scientist. The objections of the P.M.G.'s Department to adopting such recommendations appeared reasonable, but it is intended that the matter be revived five years hence when we celebrate the centenary of the Baron's appointment as Government Botanist.

Early last October the fiftieth anniversary of Mueller's death was marked by a well-attended pilgrimage, in conjunction with the Historical Society of Victoria, to his memorial at St. Kilda.

The memorial to our first President, Professor McCoy, has been restored by members of the McCoy and Royal Societies, and during the year a united pilgrimage took place at Brighton Cemetery, when native shrubs were planted around the grave.

Your committee has decided on a policy in regard to the hire and use of *Naturalist* blocks (see Vol. 63, p. 255). The Honorary Librarian reports that a number of useful volumes has been added to the library, expenditure on which has been increased beyond that of the last four years. The interest accruing to the Dudley Best Fund is set aside specifically for library purchases; although small, this assures the continuance of our subscription to a number of valued periodicals. Grateful acknowledgement is tendered to the following donors of books for the library: Miss F. Smith, Messrs. F. Lewis, P. C. Morrison, A. J. Swaby, T. S. Hart and I. C. Hammet.

The financial position of the Club has occasioned serious investigation and, at your committee's recommendation, a motion to increase the price of the *Naturalist* to 1/6 and to vary Rule 4 to provide for an increase in the annual subscription of those members who receive the Club's journal was passed at a Special General Meeting on March 10. At another Special General Meeting on May 12 a motion was carried to alter Rule 4, so that Ordinary Members will pay an annual subscription of 25/-, while Country Members and Associates who receive the *Naturalist* will pay 12/6.

While the committee was discussing the rule dealing with subscriptions, some important recommendations referring to a general revision of all the rules were considered and, *inter alia*, there arose the question of increasing the number of office-bearers.

In conclusion, we thank Mr. McCrae Howitt for the use of his office as a very convenient meeting place for the committee. To the Government Botanist, also, our thanks are due for his kindness in affording safe storage to the Club's valuable collection of water-colour paintings by Miss Amy Fuller, and for his ready co-operation in making available the officers of the National Herbarium to act on our Plant Names Sub-committee during their official time. To all members and friends who have given their time and energy in furthering the aims and ideals of the Club we tender the deep appreciation of their fellow-members.

Signed { F. S. Colliver (President).
 { J. Ros Garnet (Hon. Secretary).

FINANCIAL REPORT ON ACCOUNTS AT 30TH APRIL, 1947

Certain changes in the setting out of the published accounts this year have been decided on by the committee, following the establishment at 30th April, 1947, of the Building and Contingencies Fund and the separate Life Membership Account. The annual Statement of Receipts and Payments has been divided into three sections, for General, Building, and Life Membership. Three bank accounts are now being used in order to keep the moneys concerned separate.

The classification of the General Account items under appropriate headings enables the relation between ordinary income and ordinary expenditure to be seen clearly, and separates the special income and special expenditure. Donations given to the Club are used for the purposes for which given; subscriptions paid in advance should be carried forward into the following year as part of the balance in the E.S. & A. Bank, while proceeds of Wild Nature Shows will in future be paid into the Building and Contingencies Fund instead of the General Account. It is seen from the General Account as published that the proceeds of the show held in October last were spent as ordinary expenditure prior to the formation of the Building and Contingencies Fund, and that part of the advance subscriptions were used also within the year.

The increase in subscription rates, operative from the beginning of the present financial year, should provide sufficient ordinary income to cover the continued publication of the *Naturalist* at about the present size. Expenditure on the General Account will require to be controlled carefully in view of the fresh arrangements of accounts outlined above.

In keeping with the terms on which the Building and Contingencies Fund was established, it has been credited with the income from its investments and with the proceeds of the sale of publications, and it has been charged with fresh outlay on publications.

The Life Membership Account has been credited with the original subscription of £20, received during the year to April, 1946, and transferred now out of the General Account under Special Expenditure, also with a second subscription of like amount received in the year just ended; £1 from each of these will be brought into Ordinary Income every year until exhausted.

The principal changes in the Balance Sheet reflect the alterations mentioned above.

A. S. CHALK, A. G. HOOKER, Hon. Auditors.

FIELD NATURALISTS' CLUB OF VICTORIA

STATEMENT OF RECEIPTS AND PAYMENTS FOR 12 MONTHS ENDED 30th APRIL, 1947

GENERAL ACCOUNT

<i>Ordinary Income</i>		
Subscriptions—		
Arrears	£73	3 3
Current	322	8 6
Life Membership	2	0 0
	£397	11 9
Cash Sales of—		
<i>Victorian Naturalist</i>	£5	3 1
Badges	9	12 6
	14	15 7
Advertisement in <i>Naturalist</i>		
	3	0 0
Interest received—		
"Best" Fund, £50 @ 3½%	£1	12 6
Savings Bank Current Account	19	3
	2	11 9
Donations	10	6
Charge for Hire of Blocks	7	17 6
	£426	7 1
<i>Special Income</i>		
Subscriptions paid in advance	£26	16 1
Donation for National Parks	10	0
Hawthorn Wild Nature Show	76	11 0
Proceeds	103	17 1
<i>Total Income for the Year</i>	£530	4 2
Balance at Banks on 1st May, 1946	19	12 1
	£549	16 3

<i>Ordinary Expenditure</i>		
<i>Victorian Naturalist—</i>		
Printing	£282	0 0
Illustrating	79	12 6
Despatching	33	6 9
Index	6	15 0
	£401	14 3
Reprints	4	14 6
Postage	12	15 6
General Printing and Stationery	11	2 9
Library	12	16 2
Rent, Caretaking and Meeting Expenses	34	13 0
General Expenses	24	2 4
Donations and Affiliation Fees	7	11 0
	£509	9 6
<i>Special Expenditure</i>		
Sir Frederick McCoy Memorial		
(contributed by members, 1946)		
Transfer of Life Membership	£3	15 0
Subscription to Special Account	20	0 0
	23	15 0
<i>Total Expenditure for the Year</i>	£533	4 6
Balance at E.S. & A. Bank on 30th April, 1947	16	11 9
	£549	16 3

BUILDING AND CONTINGENCIES ACCOUNT

Income for Year—		Expenditure for Year—	
Interest on Commonwealth Bonds	£33 13 9	Publication of "Nature's Linguists"	£19 2 6
Sale of Publications	18 12 0	Repurchase of Shell and Fungus Books	3 2 0
		Balance in Savings Bank Account at 30/4/47 ..	30 1 3
	<u>£52 5 9</u>		<u>£52 5 9</u>

LIFE MEMBERSHIP ACCOUNT

Subscriptions Received to Date—		Taken into Ordinary Income to 30/4/47 ..	
Two of £20 each	£40 0 0	Savings Bank No. 2 Account at 30/4/47 ..	£2 0 0
	<u>£40 0 0</u>		<u>38 0 0</u>
			<u>£40 0 0</u>

BALANCE SHEET AS AT 30th APRIL, 1947

LIABILITIES		ASSETS	
Building and Contingencies Fund	£980 1 3	Bank Current Accounts—	
Dudley Best Library Fund	50 0 0	General Account, E.S. & A. Bank	£16 11 9
Subscriptions Paid in Advance—		Life Membership, State Sav. Bank	38 0 0
Ordinary	£26 16 1		<u>£54 11 9</u>
Life Membership	38 0 0	Arrears of Subscriptions, estimate ..	40 0 0
	<u>64 16 1</u>	Stocks on Hand, at Valuation—	
Special Donations in Hand	9 10 6	Publications	£31 4 3
Surplus of Assets over Liabilities	977 11 11	Badges	26 2 6
			<u>57 6 9</u>
		Investments—	
		Dudley Best Library Fund—	
		Commonwealth Bonds	£50 0 0
		Building and Contingencies Fund—	
		C'wealth Bonds	£950 0 0
		State Savings Bank	30 1 3
	<u>£2,081 19 9</u>		<u>980 1 3</u>
			1,030 1 3
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July 1
1947

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BIRDS OF THE PAST

By F. S. COLLIVER

(Presidential Address delivered to the F.N.C. on June 9, 1947)

That birds are descended from reptiles may be stated without hesitation. Their affinities are so close that T. H. Huxley included both groups under the term *Sauropsidia*.

The exo-skeleton of birds consists of feathers, the horny covering of the beak, claws and spurs and certain corneous plates often found on the tarsus and the feet. The skeleton of birds is remarkable for its compactness and lightness and the permeation of the bones by air-cavities.

The walls of the bones are very thin but dense in texture, and are very rich in calcium phosphate. In young birds the long bone-cavities are filled with marrow, and this marrow may persist throughout life, e.g., in certain water-birds; or the marrow may disappear and the cavity be filled with air, e.g., in the case of birds that soar and sail, etc. Again, the long bones may be completely filled with spongy bone or cancellar tissue, e.g., in the penguins.

From this it will be seen that bird bones are generally easily recognized as such.

A sternum is always present (except possibly in *Archaeopteryx*) and this is externally convex and generally broad. In length it varies considerably from group to group. In birds of flight and birds that use their wings for swimming the sternum is keeled beneath; in flightless birds it may be quite smooth. The skull is characterized by the early fusion of its constituent bones.

Due to the habits of birds generally, and to the lightness of their bones, their fossil remains are not particularly common, although in certain places—as Allier in southern France, Fossil Lake, Oregon, and certain swamp areas in New Zealand—bird-bones have been found in considerable numbers.

The number of known recent birds is something over 12,000 described species, and of fossil birds between 400 and 500, so in palaeo-ornithology we are dealing with only a small part of the class *Aves*. This makes it impossible to trace the lines of descent of existing species. Moreover, most fossil birds are from the Miocene or later horizons and are readily referable to existing families and often to existing genera, so they throw little light on the phylogeny of modern birds.

The palaeontologist is hampered by having to restrict himself to characters offered by the skeleton alone in most cases. These, of course, are factors of primary importance, but much additional evidence might be gathered from the soft parts and the plumation. These factors are well shown in dealing with the earliest known

bird, *Archaeopteryx*—it in fact it was a bird. Some workers would have it regarded as a feathered reptile.

This unique and remarkable genus is known by two nearly complete skeletons from the Lithographic Stone of Bavaria, one of which is preserved in the British Museum and the other in the Berlin Museum. They are considered as representing two species, namely, *A. macrura* and *A. siemensi*.

More recently, however, Dr. Petronievics, in the *Annals Geologiques de la Peninsule Balkanique* (Vol. 8, 1925) has suggested that they represent two different sub-classes of birds. For the British Museum specimen, the name *Archaeopteryx* is retained, whilst the Berlin species referred to *Archaeornis*. The first is considered to be a primitive ratite and the second a primitive carinate. Further, the author considers that the ancestor of birds is to be sought in a primitive group of the *Lacertillia*, and he suggests that the resemblances which have led investigators to see some affinity between birds and the Dinosaurs are to be interpreted as due to convergence.

It is to be noted that this is a radical difference from text-book teachings.

Archaeopteryx belonged to Jurassic age. It was about the size of a crow, had teeth in the adult form, and a tail consisting of an extension of the backbone with paired feathers arranged on each side, one pair to each vertebra. The feet were clawed and the pelvis not fully developed. The skull was shaped like that of a typical bird, but the cervical and dorsal vertebrae were reptilian in character. Also, a sclerotic ring was present. The wing was relatively small and the bones were slender. The feet were lizard-like, terminating in three-clawed digits. It is of interest that none of the bones appear to be pneumatic.

The bird (?) thus appears to have enjoyed a moderate power of flight and was able effectually to climb trees and rocks.

In the next Age, the Cretaceous, we have *Hesperornis*, a flightless, highly-specialized diving bird of great size, being over four feet high and having teeth the full length of the mandible.

Another bird of this Age is *Ichthyornis victor*, about the size of a pigeon, with a similar arrangement as regards teeth, but with a deeply-keeled sternum, thus indicating powerful flight.

Scomiornis, from the Cretaceous of Sweden, was the earliest-known member of the group that includes the Flamingoes, and we have odd members of other groups as well.

From Eocene times comes a large series of birds, including *Diatryma* from New Mexico. This bird has been provisionally placed in the family *Rheidae*. A Penguin (*Palaeospheniscus*) occurs in Patagonia, and a giant form (*Palaeudyptes*) is known from the Eocene of New Zealand. A Crane (*Palaeogrus*) occurs

in Italy, another (*Alutornis*) at Wyoming, and a Rail (*Gypsornis*) at Montmartre. Flamingoes (*Agnopterus* and *Elornis*) occur in the Paris Basin. The first Heron (*Proherodius*) occurs in the Lower Eocene of England, and an Ibis (*Ibidopsis*) occurs in the Upper Eocene. A relative of the Gannets and Cormorants occurs in the Lower Eocene of the London Clay, and the early ancestor of the extraordinary Hoatzin (*Fulihornis*) occurs in France.

Among the birds-of-prey we have *Lithornis* from the London Clay, *Palaeocircus* from the Paris Basin, and *Bubo* from Wyoming. A Woodpecker (*Unitornis*) and a relative of the Hornbills (*Cryptornis*) occur in Wyoming and France, in that order.

Gastornis, from the Eocene of Europe, was a large bird, at one time placed with the ostriches. It is remarkable from the fact that the bones of the skull seem to have remained free from one another throughout life.

Also in this age lived *Gigantornis eaglesomei*; the British Museum possesses a breast-bone of this largest known flying bird from southern Nigeria. It probably had a wing span of not less than 20 feet.

In Miocene times a series of gigantic birds (*Phororhacos* and allies) lived in Patagonia. Their structure suggests that they were cursorial birds-of-prey in their habits. (The Eocene genus *Diatryma* was possibly allied to this form.) The skull of the largest species, *P. longissimus*, was 0.6 metres long and the cervical vertebrae 13 cm. across, far exceeding in their dimensions those of any other bird.

In the Miocene of California, the earliest known Auk (*Moncolla californiensis*) occurs as a highly-specialized and flightless form. The recent extinction of the modern type is of interest as showing the comparatively short history of this type of bird.

The African parrot genus *Psittacus* occurs in the Lower Miocene; a true Heron (*Ardeo*) occurs in the Middle Miocene; ducks are common throughout the Miocene of France; and a Hoopoe (*Trogon*) occurs in the Miocene of France also. In deposits of this age throughout the world pigeons are common and representatives of the modern genera of the birds-of-prey are fairly common also.

From the Miocene through the Pliocene we have yet more modern genera occurring, but possibly the best known of the fossil birds occur in the Pleistocene to Recent deposits of the world.

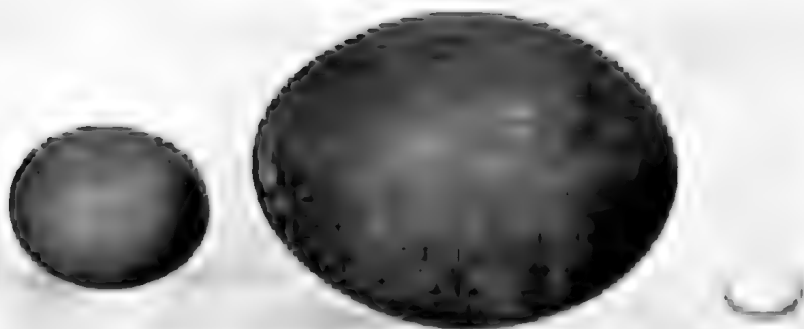
Of these *Aepyornis* from Madagascar is possibly the best known. The group is known only from fossil remains, including entire egg-shells. (Our Museum in Melbourne is the proud possessor of such a specimen.) *Aepyornis titan*, with a tibia of 80 cm. length, was quite a large bird, and the group's nearest living relatives are considered to be those bulky creatures, the Cassowaries and Emus. It would seem that the extinction of *Aepyornis* has happened in comparatively recent time.

PLATE III



The Archaeopteryx. — A restoration of the earliest winged creature that could properly be termed a bird. The wings have fingers attached, and the tail feathers are attached along the sides of a lengthy extension of the spine. From "Marvels of the Universe."

The Moas of New Zealand may be better known as extinct birds in this part of the world. The numbers and varieties of them that existed in that comparatively small country is amazing.



Egg of the Aepyornis, the largest egg known. The bird is supposed to be identical with the Roc. An egg in the British Museum has a circumference of 2 ft. 6 ins. It is shown here with an ostrich egg (left) and a hen's egg.

From "Marvels of the Universe," published by Hutchinson & Co.

Tall species of *Dinornis* have been credited with a height of 12 feet or more. However, the Riverton skeleton of *D. maximus*, as mounted in the British Museum, is only 8 ft. 6 ins. high, and it seems possible that the tallest specimens would hardly have exceeded 10 ft. in normal walking height, although undoubtedly they could reach higher. Most of the species are now well known by skeletons, yet it is just over 100 years ago that the first fragmentary large bone from New Zealand was exhibited by Professor Richard Owen to the Zoological Society of London. It was then that the eminent scientist said: "So far as my skill in interpreting an osseous fragment may be credited, I am willing to risk the reputation for it on the statement that there has existed, if there does not now exist, in New Zealand a struthious bird nearly, if not quite, equal in size to the Ostrich."

Fossil eggs of the Moa have been collected, but complete or nearly perfect ones are few. The shell is thin in comparison with that of the Ostrich and is formed of two layers, a thin inner series of vertical prismatic columns and a thicker outer layer of horizontal laminae. The surface is smooth, cream in colour and pitted with small round punctures or larger slit-like pores.

Certain known eggs can definitely be referred to distinct species, e.g., *Emeus crassus*. In this particular case the egg was found lying between the pelvis and sternum of a skeleton of that species found at Pyramid Hill.

Descriptions of dried skin, feathers and trachial rings of Moas have been given, the material usually coming from caves, but well-preserved feathers have been found 50 feet deep in river sand. Three colours in the feathers have been noted: (a) rufous with a dark central area and lighter tip; (b) brown at the base, becoming lighter distally, with a white tip; and (c) reddish-brown with dark brown toward the apex.

It is possible that certain species of Moas carried a crest of long feathers. Such an inference was made by T. J. Parker, who described the occurrence of pits in the skull.

It is now considered that destruction of Moas in considerable numbers occurred during a pluvial period following the Pleistocene glaciation. The extension of forest areas was also a disadvantage to the bird, but its survival continued until the advent of man, a thousand or more years ago. Taking over of the South Island grasslands for agriculture by the Polynesians helped in the quick extinction of the bird. Evidence is confirmed of man having taken the Moa and its eggs for food, but the deposits showing this evidence are of considerable antiquity. On the whole, however, the indications are that the earliest human occupants quickly exterminated the Moa, first in the North Island and later in the South, and that it had disappeared before the great fleet migration of 1350 A.D. brought to New Zealand the ancestors of the present Maori tribes.

Contemporaneous with the Moa, *Harpagornis*, an Eagle larger than any existing type, and a large Flightless Duck (*Cnemidornis calcitrans*) inhabited New Zealand. This latter species indicates some of the difficulties in the way of determining exact affinities from isolated bones, since from the tibia Owen considered it belonged with the Moas, while from the sternum Parker believed it to be a Rail. It was the discovery of the skull that showed it to be a Goose.

In Australia a considerable fossil bird-fauna has been described, some of which are definite extinct species, while others are known from such poor material that doubt must be placed on their determination even generically.

A large struthious bird (*Genyornis newtoni*) has been described from the Pleistocene of Lake Eyre—it is a definite extinct species, well known from skeleton material. Ducks, Pigeons, mound-builders, Moor-Hens and other types described are known from odd bones, and are doubtful records.

As regards age, the only records older than Pleistocene are a fossil feather described from the Tertiary of the Redruth District, and a Penguin from the Miocene of Christie's Beach, near Adelaide.

Going back into early history we find some interesting records

from time to time. Apparently the earliest of references to fossil birds is in a book, *De Mineralibus*, by Albertus Magnus, printed in 1495, wherein are recorded and described a fossil nest with eggs on the branch of a tree.

In 1546 Georgius Agricola, in *De Natura Fossilium*, recorded "cocks and hens, sometimes also salamanders," from a rock at the base of the mountain Hercynium.

In 1869 Joh. Weiland Valvasor recorded finding near Laudspreis "a bird's nest, together with a small bird sitting on eggs," which altogether was transformed into hard stone."

In 1707 Peter Wolfart recorded and figured the head of an Owl preserved in a coloured marble.

These and a host of other early records refer no doubt to incrustations from petrifying springs, or the fanciful tracery of dendritic markings, although some may have been actual fossils, as for example the three following:

In 1708 J. J. Scheuchzero recorded a tail of a bird or a "remige-feather in the fissile stone of Oeningen"; in 1726 Kundmann recorded "an egg entirely incrustated with tufa"; and in 1782 M. Robert de Paul de Lamanon gave in the *Journal de Physique* an excellent summary of what was then known of ornithic fossils and recorded some actual bones, that may have belonged to birds, from the gypsum quarries near Paris.

A big step forward in the literature of this subject was made when Cuvier, in his *Recherches sur les Ossements Fossiles* (1812), devoted part of Vol. III to the remains of birds and described many of the bones from the gypsum beds near Paris. Also, in his remarks he glanced over previous published statements and records.

A series of footprints from the New Red Sandstone of Connecticut, described under the general term of *Ornithichnites*, were so strikingly bird-like that they were spoken of as the tracks of poultry or as the tracks of "Noah's Raven," but their reptilian character is now well known.

Altogether, birds of the past are not well known as compared with some of the other vertebrate groups, but they and their remains constitute a highly-specialized portion of vertebrate palaeontology, and a portion to which we can expect much additional knowledge to be added in future.

Before we can make much progress, however, a knowledge of the skeletal structures and a collection covering all living types is necessary, and this in itself means much museum work, collecting and preparation. All collectors of fossils and all bird-students can be expected to work to the end of adding some little item to the sum total of the knowledge of this nature, and I look forward to members of this club doing their share in this work. Certainly there is much to be done in this field, and few are the workers to do it.

DESCRIPTION OF A NEW VICTORIAN EUCALYPT

By A. K. CAMERON, Melbourne.

EUCALYPTUS CHAPMANIANA Cameron, sp. nov.

Arbor magna ad 30 m. alta; cortex basi rugosa, cinerea, persistens, ramulis glabris albis; ligno bruno. Folia juvenilia glauca, orbiculata vel cordata, quisque 4-8 cm. longa, 3-6 cm. lata. Folia matura alternata, petiolata, lanceolata, glauca, quisque 14-26 cm. longa, 2-4 cm. lata. Venae tenuissima—venae laterales angulo 40° a costa divergentes, vena intramarginalis ad marginem proxima. Umbellae axillares 3 florum; gemmae sessiles glaucae, clavatas vel pyriformes, quisque 10 mm. longa, 5 mm. lata. Operculum hemisphericum apiculatum. Capsulae campanulatae vel ovato-truncatae, sessiles glaucae, quisque 11-13 mm. longa, 8-10 mm. lata. Discus convexus crassus; valvae 3-4 valde exsertae.

A spreading tree of 80-100 feet, with a short bole and numerous branches. Bark on trunk grey and rough, shortfibred and not wrinkled or furrowed to any extent, inner bark soft and yellow; bark on branches thick, smooth and white, decorticating in long ribbons in summer; timber pale yellow to brown (F. W. Lubke). Seedling leaves opposite for 3-4 pairs, sessile or very shortly petiolate, oblong or oval, 15-20 mm. long, 3-6 mm. wide. Juvenile leaves opposite for an indefinite number of pairs, sessile, thin, glaucous, paler below than above, orbicular to somewhat cordate, 4-8 cm. long, 3-6 cm. wide. Intermediate leaves petiolate, glaucous, oblong to broad lanceolate, 14-20 cm. long, 4-7 cm. wide. Mature leaves petiolate, subglaucous to glaucous, alternate (but occasionally opposite and flowering in this condition), lanceolate to narrow lanceolate, sometimes falcate, tapering gradually to a sharp point and the base tapering into the petiole, 14-26 cm. long, 2-4 cm. wide (measurements of 135 leaves gave an average of 19 cm. long, 3 cm. wide, with 80% of the measurements within the ranges of 16-22 cm. x 2.2-3.6 cm.). Venation fine and indistinct except for main vein. Secondary veins not close together, more or less parallel and making an angle of about 40° with the midrib; marginal vein close to, but distinct from, the edge of the leaves; petioles 20 mm. long. Branchlets glaucous. Inflorescence axillary three-flowered. Peduncle short terete 5-7 mm. long. Buds sessile, glaucous, pyriform to clavate, 10 x 5 mm.; calyx tube conical and a pale sea-green colour at maturity. Operculum hemispherical, apiculate, shorter than the calyx tube, of a yellowish brown colour at maturity. The immature buds are tipcat shaped with a sharp edge at the commissural line and resemble those of *E. cinerea* F.v.M., but are larger. Anthers versatile, opening in parallel slits. Fruits sessile, glaucous, campanulate to ovate-truncate, 11-13 mm. x

PLATE IV



Ficus affinis (Leprieux), sp. nov., "Boeing 6mm" (iron TYPE, approx one-third nat size)

Phot. : H. T. Reeves

8-10 mm.; disc domed, thickened, prominent, valves 3-4, deltoid, strongly exsert.

Specific name in honour of Brigadier Wilfrid Dinsey Chapman, M.C.E., M.I.C.E., M.I.E. (Aust.), Commissioner of the State Electricity Commission of Victoria, who first drew my attention to this subalpine tree.

The vernacular name "Bogong Gum" is recommended on account of the principal centre of distribution—around Mt. Bogong.

Localities Victoria: State Electricity Commission's private road to Pretty Valley, 2-3 miles above Bogong township (Cameron 2/3/47—the TYPE); E. Kiewa River valley from No. 3 power station to 3 miles beyond Bogong township (scattered in mixed forest); creek valley about 7 miles south of Eskdale, particularly abundant around old Iona Gold Mine (F. W. Lubke); on road to Mt. Buffalo, $\frac{1}{4}$ mile above Mackey's Lookout, near the 13-mile peg (R. Smith, Dec. 1946, in bud only). The HOLO-TYPE is in the National Herbarium, Melbourne.

Classification: From the shape of the anthers this species belongs to the *Macrantherae* (Normales). Following the grouping adopted by W. F. Blakely¹ it belong to the subseries *Oritae* of the series *Globulares*. It is anomalous in that it is the only rough-barked member of this sub-series. From the juvenile leaves it appears to be between *E. rubida* Deane et Maiden and *E. Dalrympleana* Maiden. It would be No. 235 (a) on Blakely's numbering.

Associations: In the E. Kiewa River valley this tree grows in association with *E. bicostata* Maid., Blak., et Sium., *E. dives* Schau., *E. viminalis* Labill., and *E. radiata* Sieb. Below No. 3 power station it is replaced by *E. Cordieri* Trabut. in the same association. About $2\frac{1}{2}$ miles above Bogong township it gives way to *E. delegatensis* R.T.B., which rapidly becomes the dominant species. At higher elevations *E. Dalrympleana* Maiden and *E. niphophila* Maid. et Blak. are found in practically pure stands.

Affinities:

(1) *E. rubida* Deane et Maiden.

The juvenile foliage of *E. Chapmaniana* closely resembles that of *E. rubida* but almost every other feature sharply differentiates them.

(2) *E. Dalrympleana* Maiden.

Here again there is a similarity of juvenile foliage, although not so marked as in the case of *E. rubida*, but all other features are distinct.

(3) *E. dives* Schau.

The general appearance, leaves and bark of *E. Chapmaniana* and *E. dives* are very similar and from a distance they are hard to discriminate. The buds and fruit are widely different.

(4) *E. Cordieri* Trabut.

Here again the habit, leaves and bark give these two species a superficial resemblance, but even at a distance the prominent large dark-coloured masses of fruit on *E. Cordieri* serve to distinguish it from *E. Chapmaniana*. The individual buds and fruits are widely different.

(5) *E. cinerea* F.v.M.

The immature buds of *E. Chapmaniana* closely resemble those of *E. cinerea*, but are larger. The fruits are also similar in shape, but those of *E. Chapmaniana* are two to three times larger than those of *E. cinerea*.

(6) *E. Mortoniana* Kinney.

The fruits of *E. Mortoniana* as illustrated by Maiden² appear to resemble those of *E. Chapmaniana*, but the smooth bark and green leaves of the former show it to be distinct, in addition to the differently shaped buds, short pedicels, and *costate* fruits of *E. Mortoniana*.

Acknowledgements: The type area has suffered from bushfires and because of the consequent scarring it was not possible to obtain an accurate description of the bark of the trees from that locality. The above description of bark and timber is taken from a letter from Mr. F. W. Lubke, of Eskdale, to the Government Botanist.

Brigadier Chapman arranged my visit to the type area and pointed out the trees to me and with Messrs. W. G. Chandler, M.B.E., B.Sc., Dip.For., Forester, and A. Kehle, Engineer of the State Electricity Commission, assisted in the collecting of the type material.

I also acknowledge the help and advice received from Messrs. J. H. Willis, B.Sc., and P. Bibby, of the National Herbarium, Melbourne, in the preparation of this paper.

Illustrations: The photograph illustrates juvenile and mature leaves, immature and mature buds, flowers and fruits of *E. Chapmaniana*.

REFERENCES

1. Blakely, W. F.: *A Key to the Eucalypts*, 1934
2. Maiden, J. H.: *Critical Revision of the Genus Eucalyptus*. Pl. 80, fig. 8; pl. 213, figs. 2, 3; pl. 290, fig. 8.

BAT AT BLACKBURN

At dusk on May 8th my daughter and I watched the movements of a bat which had entered a closed-in verandah through a hole in the fly-wire. It flew up and down and across the 8 feet wide verandah without pause for long periods. Never once did it touch rafter, roof or wall until it settled in some crevice, or clung to a rafter for a breathing spell. It was a wonderful exhibition of aerial navigation and illustrated the bat's power to "see" by waves or "echoes." We switched off the light and left it. Next morning it had departed.—EDITH COLEMAN.

BOTANICAL NOTES ON THE NORTHERN TERRITORY

By L. GILBERT, *Nabiac, N.S.W.*

PART II: THE MANGROVE SWAMPS

(a) *At Cape Don, Arnhem Land,*

The swamps here were particularly thick, and the trees great in both lateral and longitudinal spread. The mud was composed mainly of coral sand and a finer dark mud so that the mixture was fairly coarse. In this medium the interesting little mud-skipper revelled. Those trees which grew in the swamps right into the sea appeared to be *Bruguieras*. The flowers were similar to those of *B. Rhcedii* seen in southern Queensland, and the fruits were up to one foot or more long. After being released by the parent plant these were almost "planted" as it were by gravity and they stuck firmly into the mud if it were sufficiently soft. In the viscous mud the mangroves used their buttress-like roots to good advantage. Without these supports, standing in the swamp would be as impossible as trying to obtain oxygen without the aid of pneumatophores. Sometimes the fruits of mangroves were seen floating in the sea in an upright position so that when the tide receded (and the amount of recession was considerable) the fruits were left standing vertically in the mud, already germinated.

In some places, smaller mangroves inhabited the not-so-muddy parts near the shore proper—these were probably *Avicennia marina* and *Ceriops Candolleana*. Behind such areas, the sand was inhabited by *Melaleuca Leucadendron*,



Mangrove swamp at Port Keats.

(b) *At Marmara Swamp, Darwin.*

The trees in this swamp were much smaller and the larger *Bruguieras* seemed to be absent. In general habit, the mangroves here were shorter and thinner. Two specimens were collected from this swamp and appeared to be *Ceriops Candolleana* and *Bruguiera gymnorhiza*. Other smaller types may have been there also. Being within a reasonable distance of the sea, the mud was fairly hard and sandy, and one could walk upon it with fair ease. The knee-like pneumatophores were not so much in evidence here, but were replaced by the thinner stick-like ones.

PART III: THE RIVER FORESTS

(a) *At Southport.*

Here, two streams were continually examined over a period of five to six months. One of these was part of the upper Darwin River and the other a tributary of Berry Creek. Walks along these freshwater streams were always pleasant and what was true for one usually held for the other. *Pandanus aquaticus* (?) was the unrivalled dominant. These often grew out into the water itself, and the thorny edges of the fronds rendered swimming rather unpleasant at times. Next in position was *Melaleuca Leucadendron*, which sometimes attained enormous proportions. Some magnificent specimens of this fine tree were seen at Elizabeth River some miles farther north. In this species, there seems to be every possible combination of factors to give the impression that there are many varieties. Possibly some trees thought to have been *M. Leucadendron* are really other species altogether. Some had large spikes and small leaves; others large spikes and large leaves; others again, small spikes and small leaves, and so on. Flower colour varied between pale yellow and green. Some were upright, others weeping. Many varieties of this tree have been described from time to time (notably by Bailey) and possibly the six apparently different types collected would include:

- Melaleuca Leucadendron*, var. *Cunninghamii* Bail. (broad leaves).
- var. *saligna* Bail. (weeping habits).
- var. *lanceifolia* Bail. (narrow leaves).
- var. *viridiflora* Ewart (green flowers).

In addition, there were species of *Eucalyptus* quite at home in a damp environment. Acacias, too, were well represented along creek banks, and *Grevillea chrysodendron* was invariably seen in such localities. In some places whole areas were purple with specimens of *Osbeckia australiana* in bloom. This most beautiful shrub, with flowers like the cultivated *Lasiandra*, grew to some 4 feet. Nearby were shrubs of a species of a pale-flowered variable-leaved *Hibiscus*.

Everywhere were long grasses (including *Chloris gayana*) and amongst these twined the pretty fern *Lygodium flexuosum* in great profusion and with greatly varied pinnae—some were the spore-bearers and were finely lobed, while the sterile ones were entire. Ferns on the whole were uncommon. On the bank of a tributary of Berry Creek was found *Cheilanthes tenuifolia*, var. *nudiuscula*, with fronds 1-2½ ins. long. Not far away was found *Helminthostachys ceylanica*. *Acrostichum fraxinifolium* and *Schizoloma ensifolium* were collected on Blackmore River and Stevens Creek respectively.

Along creeks, mistletoes seemed even more common than elsewhere, possibly because birds visit the water-places frequently and it would thus be easy for viscous *Loranthus* seeds to be sown on the water-side limbs in great numbers. Acacias, Melaleucas and Eucalypts alike were all heavily attacked, and in many ways the trees were improved in appearance by the presence of great sprays of orange or red bells amongst the foliage.

At one place along the Darwin River a limb of an overhanging *Melaleuca* provided the growing place for a most striking colony of epiphytic orchids. The flowers were large, borne in big sprays, white petalled with red throats. The leaves, up to 10 inches, were deeply channelled above, and the species proved to be a rather large-flowered specimen of *Dendrobium canaliculatum*. The same orchid was seen once more in the same area—this time on a eucalypt. Only these two were seen, despite the many searches during the 50-60 excursions made around the area.

In damp situations along the creeks, where there was soakage (and in other areas, too) the families *Goodeniaceae*, *Sylidinger* and *Drasaceae* were well represented. In the quieter parts of the creeks were found water-lilies. These were small dark-blue-flowered *Nymphaeas* (only 2-2½ inches across), with round leaves, 3 or 4 inches wide. No variation in this creek type was seen. The flowers had fewer petals than other species of *Nymphaea*. Other types seen will be mentioned later.

During the dry season the rivers subside, leaving sandy deposits on either side. One of these sandy areas was found to be covered by thousands of yellow *Utricularias*. In similar creek-beds were found *Diosphylla verticillata*, and other apparently labiate plants with blue flowers having the characteristic lip-shape. Three different species of this latter type were collected. The differences between these were mainly in the leaves. In addition there were plants like *Elodea* and others like *Myriophyllum*. In some places *Spirogyra* and other algae were common.

Occasionally an extremely pretty shrub or small tree, apparently myrtaceous, was found overhanging the water. The flowers were red and borne in drooping sprays. The leaves were large (about 6 inches, and fairly broad), borne in whorls. A species of *Dionella* was plentiful in the grass along creek banks. Back from the creek, and in the open forests also, a species of *Hibbertia* was found—a small semi-erect herb.

Over many trees the Supplejack Vine (*Flagellaria indica*) trailed, and when this vine and others grew over *Pandanus* and tea-tree thickets, progress was impossible.

(b) At Manton River.

In general, the vegetation here is much the same as at Southport. In the river just below the dam were some excellent specimens of the larger *Nymphaeas* where the water was still. Some of these had pale blue blooms, others deeper, and others ranged through pink to reddish.

Here a few new climbers were added to the collection—one a white bell on a vine with pubescent palmate leaves; possibly it is an *Ipomoea*. Other vines included two species of "Native Melon" with the usual yellow flowers and divided pubescent leaves.

A small shrub growing beside the river had blue two-lipped flowers and the leaves had a "minty" smell—probably a *Prostanthera*. Another shrub nearby had four yellow petals which fell very easily. In addition there was the blue pea twiner previously mentioned.

(c) At Coomullie Creek.

Here, along the banks, were great clumps of *Bambusa* (probably *B. arnhemica*) growing with smaller clumps of *Phragmites*. The former attained a height of 30 ft. or so. As elsewhere, *Pandanus aquaticus* grew along the water's edge. Great specimens of *Melaleuca Leucodendron* and the usual grasses were present also. The grass *Rhynchosoltrum repens* was collected, and the fern *Blechnum proliferum*.

Most interesting tree was the Cork-tree (*Sesbania grandiflora*)—a king in the pea family. Some of these grew near the water to a height of 25 ft. and had pinnate leaves, thick corky bark, and enormous white drooping pea flowers, very well populated with ants, which apparently play no little part in pollination. The pods were not well developed, but even so were 13 or 14 inches long. The plant was not seen elsewhere. On the hills on either side of the creek were *Eucalypti*, *Stereulias*, *Cochlospermums*, *Acacias* and *Cycas*, as well as two species not found elsewhere.

(d) At Berry Creek (Lake Deane or Berry Springs).

More "tropical" in appearance than other areas visited, this river forest recalled a typical rain-forest. There were even a few ferns, including *Dryopteris gongylodes*, as well as species of palms. The vegetation was much thicker, the trees had larger leaves, and there were other jungle features, probably because the water is permanent, whereas most other creeks have their dry, or drier, periods as the season changes.

A large tree, somewhat thorny, almost leafless and with red peas borne in clusters, may have been Stuart's Bean Tree or another species of *Erythrina*. Another tree, also deciduous, had great five-petalled red bells. This beautiful place was rightly made a convalescent camp during the war. The water in the lake is quite deep, of a clear blue-green hue—that is possibly derived from some mineral deposits nearby.

PART IV: FRESHWATER SWAMPS AND LAGOONS

At Southport and Enniskillen

In these places were found two species of *Drosera* and at least five of the *Stylidiaceae*, the former were always well stocked with small flies and ants. Some species of *Gnadenia* also favour these localities, and there were two species of *Buchnera* (*B. tetragona* and *B. urticifolia*) which were annoying because every attempt to press them successfully failed. The flowers are white or pale blue in life; but on drying, the whole plant turns completely black—this fact aided in the identification of the plants, as Bentham mentions the feature. *Cortanema parviflora* and *Xyris* sp. were also found in such damp areas. It was thought that *Philydrium laungmosum* might be found there, but the only specimen seen was in river sand of the Pioneer Creek some miles to the west.

The trees in these damp areas were mainly of *Pandanus* and *Grevillea chrysodendron*, with sometimes *Melaleuca Leucodendron* or *Banksia dentata*. In one such place a tree which might have been *Tristania eucalyptis* was noted, while *Melastoma malabathricum* was seen at Stevens Creek (about 39 miles west of Southport).

One very large lagoon was literally covered with reed clumps and *Nymphaea* flowers and leaves; but neither has yet been determined. The water-lilies were pale and dark blue, with some almost white—all about 4-6 inches across, many-petalled and most fragrant. The leaves were orbicular and 6-10 inches in diameter. This species was probably *N. stellata* (or *N. gigantea*). In addition, there was the small dark-blue type, which seemed limited to the rivers. The ones at Manton River were probably *N. stellata* also.

In one pool on Stevens Creek the water was quite stagnant, it being the dry season; some pure white *Nymphaeas* were there, but no other type. These had the four sepals fairly well defined and not merging so gradually into petals as in the other specimens. The flowers were all about 3½ inches and the leaves 6 inches across. Thus three different varieties, if not species, would seem to be present. In the Stevens Creek pool were many specimens of *Limnanthemum crenatum*, the yellow flowers of which provided a colourful sight against the algae, leaves and white blooms in the water.

In another pool, some miles west of Southport near the Darwin River, were found some white *Limnanthemums*—*L. indicum*. Knuckey's Lagoon, nine miles south of Darwin, was well stocked with the pale blue *Nymphaea*.

Other species collected in the drier southern areas include the following: *Cassia desolata*, *C. artemisioides*, *C. cremaphila*, *Bremonia australis*, *Mirbelia oxyloba*, *Crotalaria dissitiflora*, *Helipterum strigatum*, *Myriocephalus Stuartii*, *Calotis parphyroglossa*, *Mimosa leptophylla*, *Solanum ellipticum*, *Blechnum pterosperrum*, *Bremophila Gilesii*, *E. Freelingii*, and *Trichinium helipteroides* var. *minor*.

GERMINATION OF PEAS

I should like to add a comment to Mr. Garnet's notes on the germination of peas at low temperatures (*April Naturalist*).

An incidental point of interest was that the peas germinated while still green, and it was doubted whether this would have happened at a normal temperature. However, some years ago a friend told me that, when picking peas, she found some fully grown but not "ripe" which seemed too old for the table. Merely as an experiment and with no expectation of success, she planted them, and the result was a row of healthy young pea plants.

Curious to see whether the same thing would happen again, I selected all the peas which, by culinary standards, were "old"—though all were still plump and green—in our next picking of peas, and planted them straight from the pods.

Not only did they germinate well in the open garden, but they sprouted rather more quickly than ordinary seed peas, under similar conditions. This seemed somewhat analogous to the hatching of eggs which are "set" the day they are laid. I frequently do this, knowing from experience that they will hatch in 20 days instead of the accepted 21.

The reason for this is well known. The embryo in a newly laid egg is at the right temperature for growth, and if kept at that temperature will continue to grow without check. If the egg cools to air temperature, as it usually does a short time after it is laid, the embryo becomes dormant, and makes no further growth until the right warmth is supplied. Apparently the embryo of an egg placed under a hen or in an incubator does not reach this growing temperature for about 24 hours, because eggs once cooled take approximately 24 hours longer to hatch than those which have never been below the temperature of the hen's body.

With the seeds, the variable factor is not warmth but moisture. All gardeners know that pea seeds soaked in warm water for some hours germinate more rapidly than those planted dry, as they absorb the requisite amount of moisture more rapidly from a can of water than from damp soil.

This does not, so far as I can see, affect the conclusions of Russian scientists, one way or the other, since it does not explain why the embryo in a dry seed or a cool egg becomes dormant. Nevertheless, I cannot at the moment see why it is necessary to presuppose a "growth inhibiting substance," because there is no growth when conditions are unsuitable for it.

Mr. Garnet's article was both interesting and illuminating. I should have considered 10° centigrade a most unsuitable temperature for germination. His later experiments with *Grevillea* and other seeds are more interesting still.—JEAN GALICIAN, Tyers.

MUDLARKS FLOCKING

On May 23rd a large flock of Mudlarks came over the garden and headed in a north-east direction. As I was away until May 22nd, I do not know whether there had been previous visits. It was soon after 5 o'clock. On June 2nd, at 5 p.m., a flock of Mudlarks again came high over the garden, from the north-west. They settled in a nearby gum tree for a few moments, then flew in a north-east direction. Five came back to the tree, but when I walked under it they flew in the direction the others had taken. Next day, at 5.10 p.m., we saw a few only passing over in the same direction, but had apparently missed the whole flock. On both evenings there was a vivid sunset, which we always associate with the Mudlarks.

It is interesting to recall that flocks of Mudlarks were seen twice (15/5/42 and 16/5/42) previously, and that they came over our trees at about 5 o'clock each evening; also that there was a vivid sunset.—EDITH COLEMAN.

WHAT, WHERE AND WHEN

Forthcoming Excursions, etc.

Saturday, July 12—National Herbarium. Subject: Preservation and Housing of Specimens. Leader: Mr. A. W. Jessep. Meet at Herbarium 2.30 p.m.

Saturday, July 19—Sherbrooke Forest. Subject: Lyrebirds and Fungi. Leaders: Messrs. A. G. Hooke and H. Stewart. Train 9.18 a.m. from Flinders Street to Upper Ferntree Gully, thence bus to Kallista. Fares: 2/5 2nd class rail, bus 1/- each way (total 4/5).

Saturday, July 26—Wild Life Sanctuary, Balwyn. Subject: Birds. Meet at Sanctuary entrance 2.30 p.m. Take Mont Albert tram from Collins Street. (Junior Members specially invited.)

Monday, July 28—Botany Discussion Group. Royal Society's Hall, 8 p.m. Subject: "Vascular Cryptogams," by Mr. J. H. Willis, B.Sc.

Saturday, August 2—Technological Museum. Subject: Plant Products. Leader: Mr. R. H. Fowler. Meet at Swanston Street entrance to Public Library, 2.30 p.m.

Tuesday, August 5—Geology Group. Royal Society's Hall, 8 p.m. Subject: "Build of Victoria," by Mr. A. P. Jenkin.

Saturday, August 5—Geology Group. Visit to National Museum. Subject: Relief Maps. Meet at Russell Street entrance, 2.30 p.m.

Saturday, August 9—Botany Group Excursion to Heathmont. Take 1.38 p.m. train from Flinders Street. Fare: 1/2d, 2nd class return.

Natural History for Scouts

The F.N.C.V. committee is giving assistance to the Scout movement in nature study, as part of Scout training. The botany, geology and entomology sections staged at the exhibition of Auburn Scouts on May 24 last have already been reported. On Saturday, June 14, several senior members of the district company were invited to join the Botany Discussion Group in a field excursion to Studley Park, to gain practical experience in this direction.

For King's Birthday holiday the Club arranged, at short notice, for Mr. T. S. Hart (of Croydon) and Mr. A. G. Campbell (Kilsyth) to supervise field work on trees and birds respectively, at Wonga Park, at the request of the Prahran District Scoutmasters, on their week-end training course on Scout craft.

LIFE OF *DICHOPOGON STRICTUS*

At least fifteen years ago I noticed a Chocolate Lily (*Dichopogon strictus*) flowering in a corner of the path near our front gate. Every year since it has come up, and usually it has flowered. Two years ago I cut it off slightly below ground level when weeding the paths, and thought sadly that I had killed it, but last year it came up and flowered as heartily as ever. Although I first made a note of its flowering there fifteen years ago, I think it had bloomed for many years before, possibly ever since the path was made (about thirty years ago). It will be interesting to see whether succeeding years bring any diminution of vigour. They have not hitherto, nor has the plant increased; there is still only one "crown" and one flower-stalk each spring.—JEAN GARRAITH, Pyers

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PROCEEDINGS

The monthly meeting of the Club was held on July 14, 1947, the President (Miss I. Watson) and about 150 members and friends attending.

The President announced the formation of various sub-committees, and the alteration in form of lists of excursions and notices that will appear from time to time.

A letter from Prof. O. W. Tiegs thanked the Club for good wishes on his appointment as Professor of Zoology at Melbourne University, and invited members to continue their excursions to the Zoological Department of the University.

The following were elected as Honorary Members: Messrs. A. H. Mattingley, E. E. Prescott and J. W. Andas; as Ordinary Members: Mr. and Mrs. R. B. Jennison, Mrs. W. H. Taylor, Misses A. and J. Walker, M. C. Dobson, Messrs. R. Walker, J. L. Hooper, A. Coldicutt; and as Country Members: Mrs. W. C. Campbell, Sister Milburn, Messrs. G. R. Wade, Geoff Grice, H. J. Sims.

The subject for the evening was "Natural History of the Lower Glenelg," being a discussion of the Club's Easter excursion to Nelson. Addresses were given by Mr. J. R. Garnet and Mr. J. Jones.

EXHIBITS

Mr. V. H. Miller: Photographs of kingfish caught in the Glenelg River at Nelson, and also specimens of the so-called "jewels" taken from the head of these fish.

Mr. C. J. Gabriel: Marine shells, "hammer oyster" (*Mallois albus* Lam.) from Queensland.

Mr. L. C. Viney: Aboriginal anvil stone pounder and scrapers from Sandford, Tasmania.

Mr. J. R. Garnet: *Acacia implexa* showing extreme fasciation due either to gall insects or virus disease; specimen from Churchill National Park. Aboriginal flints, limestone showing stalactitic formation, and introduced snail (*Helix pisana*) from near Nelson. Uncommon plants from the Lower Glenelg River area, including the ferns *Dryopteris pennigera* and *Blechnum nudum* var. *bipinnatifidum*, the epiphytic club moss, *Tmesipteris Billardieri*, and the flowering plants *Logania orata*, *Potamogeton pectinatus* and *Pultenaea pubescens*.

Mr. F. S. Colliver: Fossil specimens from the Nelson district, including lower jaws of the Tasmanian tiger and Tasmanian devil, also Pliocene shells and echinoderms.

THE PROPOSED GLENELG NATIONAL FOREST AND SANCTUARY

(An account of the official excursion to Lower Glenelg by members of the F.N.C.V. at Easter, 1947)

INTRODUCTION

This excursion was undertaken by Committee members of the Field Naturalists' Club of Victoria at the invitation of Mr. Noel Learmonth of Tyrendarra. Its purpose was to afford the Melbourne F.N.C. executive an opportunity of examining, if rather generally, a tract of country in the south-western corner of Victoria which we hope shortly to see established as one of the State's great National Forest reservations.

Mr. Learmonth, a country member of the F.N.C.V. and Vice-President of the Portland Field Naturalists' Club, is prominent among those who are actively interesting themselves in this project, viz., conversion to the status of a permanent sanctuary for flora and fauna of an area exceeding 80,000 acres on either side of the Glenelg River in its lower reaches. There are very good reasons why this area should be declared a sanctuary, and, in order to enlist the full support of F.N.C.V. personnel, the following report has been prepared.

Among existing reserves, Victoria possesses a number of National Parks. Some of these, like Tower Hill at Koroit, the Werribee Gorge near Bacchus Marsh and the Buchan Caves, are more in the nature of National *Natural Monuments*. Of our National *Natural Parks*, the more important ones are Wilson's Promontory (S.E. Vic.), Mt Buffalo (N.E. highlands) and Wyperfeld in the Mallee. These ostensibly "primitive areas" are reserved mainly for the conservation of their characteristic plant and animal communities. Although recognized by all biologists and naturalists and, indeed, by most discerning people as being among our greatest assets, these parks at present lack the financial endowment without which their function as sanctuaries for indigenous wild-life is inevitably precarious.

The sponsors of the present proposal, therefore, have no wish to see created yet another National Park, but would prefer what, for convenience, is termed a "National Forest Sanctuary," i.e., a permanent reservation administered by the Forests Commission, yet possessing most of the advantages that National Parks are intended to possess. An example of such a State-controlled reserve is our splendid Kulkyn National Forest (Murray River and Hattah Lakes, south of Mildura)—effectively policed by Forests Commission officers, but with conservation of wild-life as a basic concern.

Each of the three "primitive areas" mentioned above occupies a physiographically distinct region; each has botanical, ornithological and geological features not shared by the other. The Lower Glenelg, however, has advantages which none of the other reserves possesses, and therein lies its particular value.

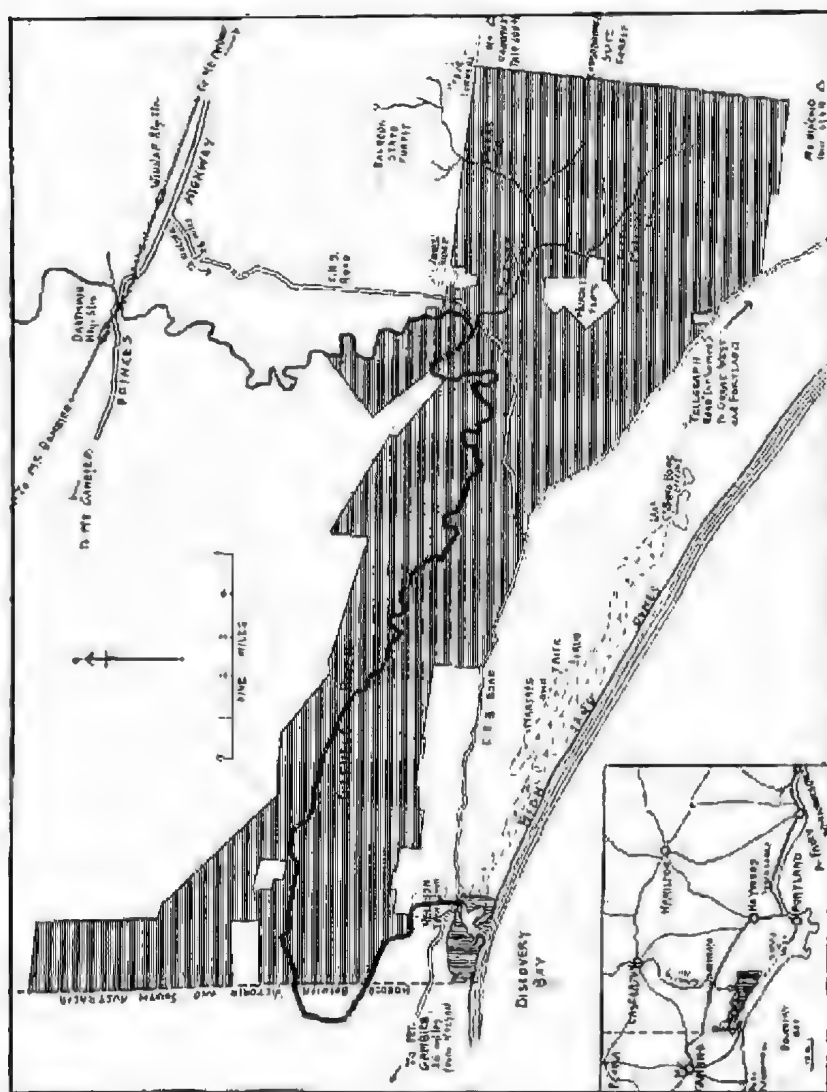
The geology of the area alone commends it as a unique National Monument. Nowhere else in the State will be found such an extensive and illuminating exposure of Miocene and Pleistocene marine sedimentary rocks. The whole region is easily accessible to inhabitants of the Western District, the Wimmera and the Mallee, and, furthermore, it should serve the needs of those who dwell in the adjacent districts of South Australia. Much of it is already under the control of the Forests Commission, but a portion at the far south-eastern end is classed as a Timber Reserve. It is possible that this latter section could be made available for selection, although the nature of the soil in the rest of the area precludes economic development through closer settlement.

This south-eastern portion is an area of lightly timbered flats, ridges, heathy moors and swamps, and for settlement to be practicable the swamps would have to be drained. Such action would inevitably bring about the inexorable drying-up of many perennial streams which feed the Glenelg. The Moleside, Little Moleside, Jones and Gallas Creeks are typical of such streams—creeks where may be seen up to a dozen or more species of fern rarely found in areas west of the Otway Ranges. The fern growth is a most important factor in the natural drainage of the area.

The extensive forests of mesquite, Baxter's stringy-bark, manna gum and occasional stands of the river red gum provide a valuable asset to the State and, coupled with such attractions as river excursions, limestone caves, wild-life camps, fishing parties, etc., serve to heighten the significance of the present project.

As a refuge and breeding place for the Koala much of the Lower Glenelg appears eminently suitable. Reliable reports already indicate the existence of a few of these favourite marsupials within the bounds of the projected reserve. That their numbers are small can be taken as evidence of the devastating effect of the all-too-frequent bush-fires. The nature of the surrounding country and of the existing settlements imposes a barrier to nearly all serious disturbers of the present "balance of nature" except man and his fires.

Of the settlements, the largest is Nelson township, near the mouth of the Glenelg—in the extreme south-west corner of the State and rather less than 300 miles from Melbourne. An all-weather road links this township with the Prince's Highway at Winnap and a journey along it gives one a good cross-section of the proposed National Reserve.



Freeholders of Nelson are particularly interested in our movement and a number of them, whose properties include the lagoon south of the township, have had these areas declared sanctuaries for native flora and fauna. Since the river flows through three or four miles of South Australian territory before reaching Nelson, it is desirable that also that section of the river and its environs should be numbered among the sanctuaries. There is reason to believe that the South Australian Government would view the matter favourably and an approach by our Victorian authorities would do much to bring about an understanding whereby the whole of the river area from Drik Drik to Discovery Bay would become a permanent and inviolate sanctuary.

In the accompanying map the shaded area shows the approximate boundaries of the proposed reserve and some of the more prominent landmarks in the district. The eastern block, together with a considerable part of the Glenelg River itself, embraces that part of the reserve which was studied by the writers during their visit. The far north-west was not examined.

—J. Ros Garnet.

DIARY OF THE EASTER EXCURSION

Owing to private exigencies at a late stage in the organizing of the trip, the party was reduced to five members, who left Melbourne by car on the afternoon of Thursday, April 3. Just before sunset we drew into Winchelsea and, on the bank of the Barwon River, boiled the billy for tea. While there we noted two items of interest: an extensive patch of creeping monkey-flower (*Minutus repens*) was growing and flowering freely beside the bridge, while on a bluestone arch of the bridge itself flourished a sapling eucalypt, rooted in crevices of the masonry; one cannot help wondering which, if left unmolested, would last the longer—the bridge or the tree. Our next stop of any importance was for supper (and more billy-boiling) somewhere between Portland and Heywood, and an hour and a half later we were at Nelson, 292 miles from Melbourne. It was now well after midnight so none of us wasted any time in getting to bed.

Friday, April 4

Having met our two hosts, Mr. Cliff. Beauglehole (President of the Portland F.N.C.) and Mr. Noel Learmonth, we renewed acquaintance with Mr. and Mrs. Eric Muir and their youngsters, who had come down from Dimboola to join the excursion. The morning was spent among the sand-dunes and marshy land near the ocean beach. While our bird-observers searched for the rare Ground Parrot which had been reported from this area a few days earlier by Mr. Eric Simson, R.A.O.U., the botanists, with no

greater success, looked for the Slender Buttercup. According to Mueller, this little plant is restricted to the Lower Glenelg River, but, as we later found, its original locality is Wando Vale, many miles to the north. However, several other plants were in bloom, including the Coast Everlasting with its aroma of beeswax, Coast Daisy-bush, Sea-rocket, Moonah or Black Tea-tree, Angled Lobelia, the Spineless variety of Sweet Bursaria, a lovely form of the Red Correa, its congener the White Correa, and several examples of an interesting variety of Yellow Gum (*Eucalyptus leucosylon* var. *macrocarpa*).

For the bird people, the lack of Ground Parrots was compensated by glimpses of the elusive little Emu-Wren, several being seen. Water-birds ranging in size from Sandpipers to the Pelican were along and on the lagoon, part of the estuary of Glenelg River. Happily this lagoon is now a sanctuary for native birds and plants.

A pleasant and leisurely climb over sand-hills down to the ocean beach revealed a panorama of Discovery Bay with its distant headlands—Cape Bridgewater to the south-east and Cape Northumberland to the north-west; at that time, gentle surf and a clean beach made a peaceful, idyllic scene. To the seeker of aboriginal relics, these dunes and shores have yielded many interesting ethnological "finds"—native middens are still to be found among them.

The afternoon was spent near Mr. Simson's home, a mile or so above the township and on park-like land alongside the Glenelg. Here we rambled along the river bank and noted a profusion of birds and plants. Surprises among the latter were Blue Gum and Yate, both (so we were told) introduced there many years ago and now quite evidently thriving and increasing in number among the native Banksia, She-oak and Moonah. Hereabouts were seen shrubs of the starry-flowered Twiggy Daisy-bush, the *Ixodia*, whose clustered flowers are remarkable in that they can be seen closing up whenever rain begins to fall on them, and two species of *Boobialla*, with the little Spreading Bluebell and Bundled Guinea-flower among lesser vegetation.

Mr. Simson mentioned to us that four emus had been wandering near his gate only a few minutes before we arrived and, as we subsequently noted, that flocks of up to sixteen are not uncommon on the moorlands in this region. Even more interesting visitors who left before our arrival were some Black-winged Currawongs—birds usually seen farther north.

Saturday, April 5

Directly after breakfast and with ample lunch (including such amenities as a brace of roast chicken—nicely seasoned) we left

"The Cottage," our headquarters, and sped off to examine some of the country in the south-eastern sector.

On the way we passed a flock of emus wobbling away across the heathland and, about sixteen miles east of Nelson, paused to see the spot where Moleside Creek joins the Glenelg River. Here, high up on the trunk of a gum tree, was nailed a board which gave notice of the 1946 flood level. This was the spot where we had at first intended to establish a base camp—a truly pleasant place, which can be recommended to anyone who prefers to take his pleasures away from the hurly-burly, a place where one can quietly fish or walk or swim and where wild-life abounds, where the Platypus lives and the Azure Kingfisher hunts. (The Platypus, by the way, is evidently a rather more adaptable animal than is usually believed. Mr. Simson has seen them in the salty tidal waters, about a mile from the mouth of the Glenelg River!)

There are several huts and a cottage on the steeply sloping, tree-sheltered south bank of the river; even a Buffalo grass lawn, overhung by weeping willow in company with tea-tree, eucalypt and wattle, did not seem out of place.

From this junction we were taken along bush tracks to the Little Moleside Creek, near a spot known as Hurdle Flats. After an early (and satisfying) lunch we walked south-east, following the general direction of the stream for a few miles until the country became a little difficult for easy walking even up on the ridges.

Excepting Silver-eyes, Thornbills, and an occasional Honey-eater, birds were not plentiful. The autumn season was evidently responsible for this scarcity; on previous visits Mr. Learmonth had recorded numbers of Wood-Swallows, Satin Flycatchers and Rufous Fantails along this stretch of creek.

At last we climbed down to the stream and came upon a fine fern gully: Soft Tree-fern with its epiphytic Long Fern Clubmoss, Austral King fern, Fishbone and Maidenhair ferns were there—we almost expected to find a Filmy- or Bristle-fern, but none was seen. Some of us, in the hope of discovering rarities, and believing that we would probably tumble into the water in any case, elected to wade upstream for some distance. It was tiring enough, but much less exhausting than pushing through dense scrub which covered the steep gully slopes. Our reward was the sight of a small cascade dropping over basalt rocks, almost concealed in a dell of tree-ferns.

Along the banks flourished the Hop Goodenia (in flower) and Prickly Currant-bush with ripe red and tasty sweet fruits: its prickly nature was not unheeded by those of us who happened to grasp it in an endeavour to avoid stumbling deeply into the water. Other well known plants, and some not so well known to us,

included Golden Tip (abundant), Indian Weed, the Mitchell Wattle with still an occasional flower-head, Spike Acacia in advanced bud, Sweet Bursaria in flower, Wrinkled Pomaderris, and a few plants of the Downy Bush-pea (*Pultenaea pubescens*)—a species confined to this south-west corner of the State.

Leaving the pursuance of Little Moleside, to its headwaters, to Cliff. Beaglehole and Bill Grubb—the school teacher at Nelson—we made our way back downstream to join the remainder of the party. Again we divided, some to wander back the way they had come, others to climb the ridge and survey the surroundings from a 350-foot vantage-point.

Six or seven miles away to the north-west could be seen the sharp outline of Jones' Ridge, near a bend in the Glenelg known as Keegan's. To the south-east, at an equal distance, was Piccaninny Mount and three miles farther on Mount Kincaid (650 ft.), while to the north-east was the 600 ft. Mount Vandyke with its trig. station and look-out tower. All these landmarks, except the Piccaninny Mount, are just beyond the boundaries of the proposed reserve, while the immediate landscape, with its swamps and heathy rises, creek valleys and timbered ridges, is the watershed of all the little streamlets, perennial or otherwise, that feed the Moleside Creek and Lower Glenelg.

The flora of the heathy hilltops, even at this time of year, provided a colourful sight with abundance of Red Correa, Prickly Broom-heath, Common Heath, Flame Heath, Ground-berry, Waxy Boronia and Woolly Everlasting. While we were engaged in taking these bearings, Beaglehole and Grubb came into view—much after the manner of Stanley, crashing through the jungle to greet Dr. Livingstone. With this additional company we made a bee-line to the Hurdle Flats base, which was reached in sufficient time to have the indispensable billy on the fire to greet the rest of the party. This welcome refresher over, we packed up and covered the 23 miles back to Nelson in good time; several big 'roos thumping their way through lightly timbered forest provided an enjoyable sight *en route*.

Sunday, April 6

Following yesterday's exertions, a launch trip for 16 miles up the Glenelg came as a special treat. For this pleasant interlude we were gratefully indebted to Mr. Harry Youngman of Grassdale. Those of us who had no previous acquaintance with the lower reaches of this noble stream were surprised to find ourselves upon water often 100 yards wide and in places up to 150 feet deep, the Glenelg had carved its way through the rising land-mass, now to flow through a deep limestone gorge which, in many places, towers considerably more than 100 feet above the water level.

PLATE V



Park-like Stringybark Forest, beside the Glenelg River at Simson's
(two miles above Nelson).

Photo.: Miss Ina Watson.

In full glory of a brilliant day we followed the sinuous course of the stream, lazing on deck, "spotting" birds, watching a pair of Wedge-tail Eagles soar effortlessly above us; some of us looked yearningly at the high limestone cliff-face as we passed by, thinking of the rare plants that might be there, yet inaccessible! Holiday-makers were out in their dinghies, hopefully fishing; waterfowl were on the water and above it, and other birds were there in numbers.

The launch pulled into one of the many little coves along the gorge and, after lunch, we rowed the dinghy back to a spot where we had noticed an abundant growth of fern on the dripping rock face. Here were several objects of special interest to the botanists—all forming a little community on the limestone cliff-face. The fern was *Dryopteris penungera*, the Naked Wood-fern—a lime-lover—but we gave it the more euphonious vernacular, "Dripping-rock fern": its nearby associates included such diverse plants as Oval-leaf Logania, Rough Stinkweed, Angled Lobelia, Small-fruit Fan flower, Myrtle Acacia, and what was probably one of the Flax Lilies. In the water beside the cliff, actually flowering under the water, was the Fennel Pondweed, and it was from among the tangle of stems of this plant that we collected specimens of a "Fresh-water Spider Crab"—an object little more than a quarter of an inch in diameter and since identified at the National Museum as *Halicorecinus lacustris*.

On the return trip a stop was made to give some of us an opportunity of visiting the "Princess Margaret Rose" Cave, a scenic attraction about nine miles from Nelson and situated in a hill around which the river curves at this point. The circumstances of its discovery are interesting enough to record.

A party of trappers, combining pleasure with business, were searching for accessible openings to caves which were thought to exist in the area. High up on the wall of the gorge they had the good fortune to come upon a hole which, though little more than two feet in diameter, was large enough to admit one of the men; he was lowered by rope to the bottom, fifty feet below the surface. To the consternation of his mates above, he remained there for more than two hours—just exploring. When hauled to the surface, he told of the existence down below of a lovely cavern—stalagmites, stalactites, columns and pillars were there and numbers of bones. These bones have since been identified as those of present-day animals which had had the misfortune to tumble down the hole. The scratchings of those that survived the fall may still be seen at several places within the cave—at breaks in the walls of the cavern where the wretched prisoner doubtless hoped to claw its way to freedom.

Now maintained as a business venture, illuminated by electric light and made more easily accessible, the cave proves an attraction to most visitors to the district and the enterprising Hutchinson brothers, who have charge of it, are still labouring to extend its passages, they hope ultimately to cut through to a cavern whose opening can be seen from the river, high up on the limestone face of the gorge.

The cave, as at present known, traverses the limestone to a depth of about 90 feet, but at that depth it is still well above the level of the nearby river. Within the caverns may be seen good examples of fossil marine shells embedded in the soft limestone walls, while the glass-like stalactites forming the more spectacular features of the cave sometimes grow for a few inches in a remarkable horizontal manner.

Yet another curiosity, in several places below the 60-foot level, was the pendulous strands of living tree roots—emerging from the roof perhaps 30 feet above the floor and hanging like wisps of hair quite 10 feet long. If, as we concluded, they were the roots of Stringy-barks that flourished above the cave, the phenomenon exhibits "aerial root" formation among *Eucalyptis*. It is just as possible, however, that they had their origin in the Austral Grass-tree which was conspicuous among the rich flora of the hill.

On the homeward run, the quick eyes of bird-observers spotted the Azure Kingfisher and added several more birds to their growing list. It is interesting that Gang-gangs, so common in the Moleside area and farther upstream, are seldom seen in these lower reaches of the river. Swallows are the most common birds, nesting on ledges of the cliffs. As the river is tidal for nearly 40 miles upstream, the birds must know the tidal limits because some of these nesting ledges seem perilously close to the water. For some miles on either side of the river there are extensive patches of reeds where one might expect to find Reed-warblers. These reed-beds were closely studied, but the bird was not seen during our trip, although Mr. Simson has recorded it.

Another geological feature of special interest was pointed out to us—the Dry Creek. From the river, one observes a gap in the north-west bank a few miles upstream from Nelson—a gap which lacks the usual features associated with tributary junctions. It is, in fact, a well-grassed dry watercourse, the origin of which is apparently veiled in the mists of geological time.

Informed opinion suggests that it was at one time the bed of a substantial stream flowing from a westerly or north-westerly direction. Volcanic eruption of Mt. Schank, S.A. (about 20 miles west of the present course of the Glenelg River and mid-way between Mt. Gambier and Port MacDonnell) filled the surrounding valleys with lava, obliterating the sources of the stream. Today

it is recognized only by the dry channel which opens into the Glenelg. *Apropos* the country covered in this manner with lava, Mr. Beaglehole mentions that it now supports a vegetational cover of diminutive species of the type represented by Scaly Meadow-grass, Branching Daisy and a dwarf form of the introduced Beard Grass, all annuals under three inches high and appearing seasonally in myriads.

That evening we all attended a special meeting of the Nelson Progress Association—a meeting called to discuss the National Forest project. Each was asked to speak and, according to his or her inclination, referred to the value and importance of the proposed reservation or discussed some relevant aspect of natural history. Mr. Garnet spoke on National Parks, Miss Ina Watson remarked on the bird-life, Mr. Beaglehole referred to the flora, and Mr. Cudmore discussed the geology of the district. If we added at all to the enthusiasm of members of the Association for the scheme we can feel that the evening was indeed well spent.

Monday, April 7

It was agreed by all that this day's outing provided the highlight of the trip. The weather still left nothing to be desired and in brilliant sunshine we motored across to the Moleside Creek bridge, some 18 miles to the east of Nelson, where we came upon two "jeeps" with their complement of fellow-naturalists from Portland. Through the kindness of Mr. Norman Wade, these vehicles were provided to carry us over several miles of trackless bush to Jones' Creek—a tributary of the Moleside. Before commencing the journey we spent a short time examining the vegetation and bird-life near the bridge. Here again we found the Naked Wood-fern in abundance, growing as usual on limestone rock beside the well-sheltered creek. The ornithologists divided to cover the creek area, those to the south of the road finding an area barren of birds while the pair to the north struck a rich "pocket" and returned with several additions to the list, including the Spotted Quail-thrush.

At last, perched aboard our "jeeps," we nosed through the scrub and forest, "jumping" those fallen logs which stood as a barrier to our progress. Our speed—four miles in $1\frac{1}{4}$ hours—was moderate enough to permit some collecting and so to our plant list we were able to add the Wiry Banera, Rough Daisy-bush, and handsome, large-headed crimson spikes of the Common Heath—in full flower during the first week in April! The four miles of country was at no place higher than 300 or 400 feet above sea-level; for the most part it is gently undulating and well covered with a somewhat fire-spoiled forest of Baxter's Stringybark and Manna Gum. Where fires have been more persistent a sturdy undergrowth of

bracken exists—particularly on the slopes and stream banks, as we found to our discomfort later in the day.

In the marshy areas and near frequent water-holes the undergrowth was fairly free from bracken, its substitute being a variety of rushes and sedges and such other swampy heathland shrubs as *Melaleuca*, *Sprengelia*, *Epacris*, *Bossiaea*, *Platylobium*, and so on. Where we stopped for lunch, Jones' Creek had carved for itself a deep valley and four of us determined to spend the afternoon following the course of this creek to its junction with Moleside and, ultimately, to the bridge where we had met the "jeeps" that morning.

The walk was strenuous enough but profitable in several ways. We found no Soft Tree-ferns in the gullies, but King Ferns flourished in great abundance—more especially in open parts of the gullies. In other parts, and with the King Ferns, grew one or more *Blechnum* species (*nudum*, *lanceolatum*, *procerum* and *cuspense*), while in another spot (unhappily infested with ravenous leeches) we came upon a very striking and beautiful variety of the Fishbone Fern—*Blechnum nudum* var. *bi-pinnatifidum*. It is unteworthy that in all our rambles through places where ferns thrive (i.e., within the limits of the proposed National Reserve) no plant of the epiphytic Kangaroo Fern was observed, either in the basaltic or limestone gullies. It was gratifying to find that all gullies throughout the same area appear to be entirely free from the blackberry pest.

Although one might easily gain the impression that this country was practically unknown and untrampled (neither broken glass nor rusty tins are present), any such illusion was dispelled when one of us stumbled over the trailing strand of a one-time post and wire fence (long since destroyed by fire) near the junction of the Gallas and Moleside Creeks and miles from any present-day settlement.

The orchid flora of the south-west is rich, yet we observed only two species of that family, viz., *Eriochilus cucullatus* and *Dipodium punctatum*—both in flower and, as to the *Dipodium*, very late in the season for such a low altitude.

At the bridge we farewelled the crew of the "jeeps" and, while packing up our belongings, devoted a few minutes to capturing some graceful flying insects which were swarming above us. A specimen, since submitted to the National Museum, has been identified as an adult Mayfly—an undetermined species of the Order *Plecoptera*. What attracted our attention to the insect was not only its gregarious habit, but its graceful appearance when in flight: its two larger diaphanous and strongly veined wings were outspread while its two relatively very long hind legs trailed behind, pointing downwards.

We were ready for a refreshing sleep after such a busy day, but our insatiable curiosity got the better of us and, instead, we rounded off the trip by a visit to the private museum of Mr. Vause of Nelson. Here we were shown an interesting collection of aboriginal implements, marine shells, minerals and fossils. One of the party was anxious to study at first hand the tonal values of native bull-roarers and he adjourned to the darkness of a nearby paddock to operate the instrument. While the bull-roarer was being recovered from the roof of Mr. Vause's house, the owner—himself an expert—produced a second one which unfortunately disappeared into the paddock. We believe these instruments, reputedly used for instilling a proper degree of fear into the black gins, can be heard several miles away.

Tuesday. April 8

In the still bright morning sunshine we said a reluctant farewell to our Portland hosts and friends, leaving them with the assurance that every moment of the excursion had been enjoyed by all. We carried away a full appreciation of the tremendous value which such a flora and fauna reserve as the Glenelg National Forest might be to the people of this State. Through the great kindness and hospitality of Messrs. Noel Learmonth, Cliff, Beaglehole and their good friends who had gone to so much trouble, we had been able to examine much of this area and, with them, were convinced that immediate action should be taken to have it proclaimed a permanent sanctuary for flora and fauna. It is our earnest hope that this report will convey to our fellow-citizens, be they members of the Field Naturalists' Club or not, some idea of the beauty and grandeur of the Lower Glenelg, the charm of the almost virgin bush with its little creeks and fern gullies, and of its value as a nidus for those types and communities confined to the south-west corner of Victoria.

To conclude on a last note of appreciation, we also record our gratitude for the efforts of Mr. Frank Chapman, who, besides comfortably and safely transporting us to and from Nelson, did his best to keep our table supplied with fish from the Glenelg; he joined us on some of our trips and, as a consequence, almost became converted to ornithology.

—Ina Watson, J. R. Garnet, R. D. Lee, A. Burke,
F. A. Cudmore.

GEOLOGY OF THE GLENELG AREA

By F. A. CUDMORE

Tertiary marine rocks are prevalent in the coastal area on both sides of the State border. The oldest is the creamy-white bryozoal Miocene limestone, which at Mt. Gambier is quarried for a building stone and sometimes railed to Melbourne. At Nelson it may be seen at the Glenelg River bridge, and from that point upstream is well exposed in the river cliffs on either side of the valley, to a height in places of approximately 150 feet. These beds often show a dip of a few degrees. The cliffs contain cave openings, while a couple of miles west of Nelson various "swallow holes" were inspected. Here an area of the surface limestone had undergone dolomitization into a pink rock.

Some years ago a bore was put down at Nelson in search of oil. It penetrated the limestones and much black sand with lignite, to a depth of more than 7000 feet, without reaching bedrock. The Tertiary sea was deep here.

No good locality for fossils was found, though a few pectens, sea-urchins and lamp shells were seen. However, a visit was paid to Port Macdonnell, S.A., 20 miles from Nelson, in search of the cidaroid *Phyllacanthus duncani*, Chapman and Cudmore. From the limestones below high tide mark, about 300 yards east of the dune-rock cliffs, a good collection of fragmentary tests and complete spines of this regular sea-urchin was secured and lodged in the National Museum. Associated with it, as at Flinders, Batesford and Castle Cove in Victoria, was the fossil sponge *Tractocalia pexica*, Hinde. Miocene flint was abundant.

In Pleistocene times the sea again encroached upon this part of Australia, to a point in South Australia about 50 miles from the present coast. Coastal dunes and rocks containing sea-shells were formed on top of the limestones, in places 200 feet above present sea level. These deposits, sometimes current-bedded, may be seen along the Glenelg. As the sea receded, the river extended its course and gradually cut its present deep gorge.

More recently there has been a further change in land and sea level, as shown by the depth of water in the river (70 ft. at Simson's Landing), its tidal nature and the passage of sea-water upstream for many miles.

About two miles west of Nelson a resident of the district (Mr. Holloway) kindly showed the writer a fine example of Pleistocene beach. Flints have been washed out of the limestone beds, rolled upon the beach and cemented into a pebble bed. A specimen has been given to the museum at the University.

Much of the coastal region near Nelson consists of dunes or dune-rock. The only other rock noted was a basalt near the source of the Moleside Creek.

VEGETATIONAL FEATURES OF THE GLENELG

By J. ROS GARNET (assisted by CLIFF. BEAUGLEHOLE)

Ecologically, the area and its adjoining sanctuary include seven types which are readily defined by their characteristic vegetation. Briefly they are: (1) Forest, (2) Swamp, (3) Riparian, (4) Estuarine and Saltmarsh, (5) Coastal and Sand-dune, (6) Heathland, and (7) the settled area of the Nelson township. A few remarks on each of these major communities may be of interest.

(1) The forest area reaches its best development in the old volcanic region to the east. It is intersected by numerous deep gullies in which occur a wealth of ferns and mosses. They provide the nearest approach to a typical Gippsland fern gully that is to be seen in the far south-west of the State. It is surprising to find tree-ferns in such profusion and of especial interest that the epiphytic fern-clubmoss *Tmesipteris* is present, so distant from its rain-forest habitation in the Otways and Gippsland hills; communities of gully mosses thrive in the shade of big ferns, and it would be of great interest to know what fungi are also associated (in season).

Throughout the whole region the widespread and dominant tree of the forest is Baxter's Stringybark—probably the most extensive area of the species in Victoria. Drooping Mistletoe is also well established and its abundance in some localities suggests that the forest, in such places, has reached its full maturity and is now ready for silvicultural attention.

(2) Swamps are extensive in the coastal strip between the sand-dunes and heathy sandhills of the southern boundary and they cover considerable areas beyond the eastern boundary, around the source of Surrey River and extending along its course towards Heathmere and Gorae West. Within the boundaries they often occur as pockets in the forest and heath areas, where they are sometimes a prominent feature.

(3) The riparian type of country is entirely within the boundaries of the reserve. The river in its lower reaches, winding for several miles through a deep and magnificent limestone gorge, and the accompanying wealth of plant and animal life provide an unforgettable scene of beauty and grandeur. Sir Thomas Mitchell wrote of it (*Three Exped.*, 1838, Vol. 2, p. 233): "The scenery on the long reaches was in many places very fine from the picturesque character of the limestone rock, and the tints and outlines of the trees, shrubs and creepers upon the banks. In some places stalactitic grottoes, covered with red and yellow creepers, overhung or enclosed cascades; at other points Casuarinae and Banksiae were festooned with creeping vines." This picture is essentially true today.

(+) The estuarine and saltmarsh area is not actually within the projected boundaries, although, as mentioned above, it *is* now a sanctuary for flora and fauna. The river from Drik Drik to Nelson bridge is a deep tidal stream, but from the bridge to the mouth it passes through the low-lying coastal belt. After passing the bridge it expands into a wide lagoon from which it emerges, broad and shallow, to traverse the substantial sand-bar across Discovery Bay.

The lagoon is of quite recent origin. When Mitchell visited this area the river flowed directly south to the sea, but subsequent development of high sand-hills dammed back the river which, from the lagoon so formed, now flows in a south-westerly direction into the Bay. Because of this change the halophytic (or salt-tolerant) plant communities present are also of recent development, the principal types adjacent to the lagoon and estuary being mainly residuals of the older swamp communities and of the normal coastal-sand types. In consequence of its tidal nature, the river has been colonized by such halophytes as the Glassworts; these grow on small mud flats occurring at various places along the course of the river for several miles upstream.



Lagoon and Coastal Sand-hills at Nelson.

Photo.: Miss Ina Watson.

This change in the course of the stream near its mouth has provided some puzzles for present-day field botanists. In the early days of botanical exploration, by such men as Mueller, Tenison-Wood, Allitt and Eckert, a number of plants was collected and recorded as from the "Glenelg Mouth." Some of these, e.g., Forest Bitter-cress and Soft Tree-fern, were never likely to have been found in such an environment whatever the course of the

PLATE VI



Typical Limestone Cliffs above the Glenelg (from a motor-launch on the water).

Photo. : Miss Ina Watson.

river. The principal puzzle is, what was meant by the expression "Glenelg Mouth"? From the kind of plants these early botanists recorded, it seems reasonable to suppose that "Glenelg Mouth" embraced any and all portions of the land that we now hope to see proclaimed as a National Forest and, in addition, included the region in the immediate vicinity of the actual mouth of the river.

The lagoon and estuary now provide a delightful setting to the little township. The bird-lover will find this sanctuary rich in aquatic birds and waders, while the less ambitious sightseer will treasure the memory of beautiful sunsets reflected in the placid waters of the lagoon against a background of distant sand-hills.

(5) The coastal and sand-dune region, also beyond the reserve boundaries, shows interesting transitions toward the marsh, estuarine and heath regions, all four types being represented within the limits of one square mile on the east side of the river. The true littoral and sand-dune vegetation includes the quite localized Coast Ground-herry (*Acrotriche cordata*) and a number of more widely distributed plants found only in such an environment. The marine Fibre-ball Weed (*Posidonia australis*) is almost certain to occur at Nelson, since the fibre-balls derived from it have frequently been collected on the shores of Discovery Bay.

(6) The heathlands, home of numerous emus and smaller birds, are fairly extensive, occurring as a wide belt running parallel with the coast and intruding into the forest area near Hurdle Flats and the Little Moleside Creek (eastern sector). Here they present a colourful picture of richly vegetated sandy ridges and gravelly rises where may be found many plants worthy of note, such as Victorian Smokebush, Mitchell Wattle, Woolly Everlasting, Red Correa, and Waxy Boronia.

If these heathlands are as rich and interesting as those nearer Portland they will prove a distinct acquisition to the reserve and assure the conservation of many plant communities that are in danger of extinction through the more intensive agricultural development of the Portland heathlands.

(7) Finally, there is the settled area at Nelson, providing contrasts of botanical and more general interest. It comprises open grasslands mingled with once-cleared paddocks which are being quickly re-colonized by some of the indigenous flora. During a brief visit in the spring of 1946, Mr. Beauglehole noted that the Golden Moth or Snake Orchid had re-established itself in one paddock to such an extent as to provide a veritable field of golden yellow. He has recorded 117 naturalized alien plants for the whole Lower Glenelg area; the great majority of these were noted only about Nelson settlement and have consequently been omitted from our consideration of the proposed National Forest—farther north.

CHECKLIST OF THE INDIGENOUS FLORA OF THE
LOWER GLENELG

By CLIFF. BEAUGLENHOLE, Gorae West, Victoria.

EXPLANATION OF SYMBOLS, ETC.

- R. River plants, found along the Glenelg itself.
 C. Plants of the tributary creeks, chiefly of Moleside Creek and its branches, but not necessarily present in all.
 H. Heathlands, chiefly toward the east of the reserve.
 O. Open country, as along the western boundary.
 F. Forest land throughout.
 S. Swamps, scattered through the area.
 w. Widespread in the whole area; where followed by capital letters, these indicate the formations in which the species is most prevalent.
 v.c. Very common and usually conspicuous.
 r. Rare—only a few plants noted.
 * Species not yet recorded from the Portland district.
 ? Records of earlier botanists, mostly labelled "Mouth of the Glenelg," but precise locations unknown—the majority would probably be coastal.
 N R.—Plants peculiar to the coastal dunes, river mouth and estuarine salt marshes, and Nelson settlement (including lagoon) are beyond the proposed National Forest boundaries and have not been taken into consideration.

SYSTEMATIC ARRANGEMENT

I. NON-VASCULAR PLANTS, EXCLUDING ALGAE AND FUNGI
(28 spp., but the list is very incomplete).

BRYOPHYTA

MARCHANTIACEÆ

Marchantia cephaloscypha—w.

RICCIACEÆ

Ricciocarpus natans—C.

ANEURACEÆ

**Aneura multifida* (?)—C.

METZGERIACEÆ

Metzgeria furcata—C. (r).

DILAFNACEÆ

Symphogyna interrupta—w, C (v.c.).

HARPANTIACEÆ

Chiloscyphus fissistipus—w, C (v.c.).

POLYTRICHACEÆ

Polytrichum commune—w, v.c.

FISSIDENTACEÆ

Fissidens oblongifolius—C (v.c.).**rigidulus*—C.

DICRANACEÆ

Campylopus—w.*introflexus*—w.*insitius*—w, H (v.c.).*Dicranoloma dicarpum*—C.

BRYACEÆ

Bryum truncatum—w, C (v.c.)

BARTRAMIACEÆ

Breutelia affinis—w.

RHACOPILACEÆ

Rhacopilum cristatum—w, C.

PTYCHOMNIACEÆ

Ptychomnion aciculare—w, C

LEMBOPHYLLACEÆ

Lembophyllum divulsum—C.

HYOPTERYGIACEÆ

Hypopterygium novae-seelandiae—C (v.c.).

THUIDIACEÆ

Thuidium furforosum—w, v.c.

BRACHYTHECIACEÆ

Brachythecium rutabulum—w, v.c.*Rhynchostegium tenuifolium*—w, v.c.

HYPNACEÆ

**Hypnum cupressiforme*—R.

LICHENES

PARMELIACEÆ

- Parmelia*
 - physodes*—w.
 - perforata*—w, v.c.

USNEACEÆ

- Usnea barbata* (L.)—w, v.c.

CLADONIACEÆ

- Cladonia*
 - aggregata*—w.
 - furcata*—w, v.c.
 - pyxidata*—C.

II. VASCULAR PLANTS (511 spp.)

PTERIDOPHYTA

OSMUNDACEÆ

- **Todea barbara*—C.

GLEICHENIACEÆ

- Gleichenia microphylla*—C.

DICKSONIACEÆ

- Dicksonia antarctica*—C.
(*Abundant in Little Mole-side Creek.*)

POLYPODIACEÆ

- Hypolepis punctata*—C.
- Lindsaya linearis*—w, H.
- Pteridium aquilinum*,
 - var. *esculentum*—w, v.c.

- Pteris tremula*—C.

- Adiantum aethiopicum*—w.

- Cheilanthes tenuifolia*—R.

- Blechnum*

- nudum*—C (v.c.).

- *+ var. *bipinnatifidum*—C (r).

- capense*—C (v.c.).

- procerum*—C (v.c.).

- **lanceolatum*—C (v.c.).

- Asplenium*

- flabellifolium*—?

- **bulbiferum*—?

- Polystichum proliferum*—C.

- (*from P. aculeatum*).

- Dryopteris pennigera*—R, C.

- (*Abundant in Little Mole-side Creek, also at Drifting Rock, Glenelg River; previously, known only from near Port Campbell in Victoria.*)

SELAGINELLACEÆ

- Selaginella Freissiana*—w, S.

PSILOTACEÆ

- Tmesipteris Billardieri*—C.

- (*The westernmost record of the genus for Australia—in Little Mole-side Creek, on tree-fern trunks.*).

SPERMATOPHYTA

TYPHACEÆ

- Typha angustifolia*—C.

POTAMOGETONACEÆ

- Potamogeton*
 - australensis*—S.
 - **pectinatus*—R.

SCHEUCHZERIACEÆ

- Triglochin*
 - striata*—w, S (v.c.).
 - centrocarpa*—O.
 - procerum*—w.

ALISMACEÆ

- Alisma Plantago*—S (r).

GRAMINEÆ (32 spp.)

- Hemarthria uncinata*—w, v.c.

- Themeda australis*—w, v.c.

- Imperata cylindrica*—O.

- Microstachya stipoides*—w.

- Tetrarrhena*

- **juncæ*—R (r).

- distichophylla*—w, v.c.

- Stipa*

- **eremophila*—O.

- (*Near Nelson, but typi-cally a Mallee grass.*)

- Muelleri*—O (v.c.), F.

- pubescens*—w

- mollis*—w.

- variabilis*—O.

- Echinopogon ovatus*—R.

- Agrostis*

- venusta*—S.

- avenacea*—w.

- (*syn Calamagrostis filiformis*).

- rudis*—S, C.

- Dryocuxia*

- quadriseta*—w, v.c.

- densa*—O (r).

- Dichelachne*

- crinita*—w, v.c.

- sciurea*—w.

- Pentapogon quadifidus*—F.

SPERMATOPHYTA (cont.)

GRAMINEÆ (cont.)

Amphibromus Neesii—w, S.

Danthonia

setacea—w.

pilosa—w.

semiannularis—w.

Phragmites communis—w, R
(v.c.).

*Triodia irritans—O.

(Between Dry and Princess
Margaret Rose Creeks;
typically a Mallee grass.)

Eragrostis Brownii—O.

Poa

caespitosa—w, v.c.

+var. tenera—w.

lepidia—O (v.c.).

sp. (hairy)—w, v.c.

Glyceria fluitans—w, S.

Agropyron scabrum—w, v.c.

CYPERACEÆ (41 spp.)

Eleocharis acuta—w, v.c.

Scirpus

cernuus—w.

antarcticus—w, O.

inundatus—w, S.

nodosus—w, v.c.

validus—R.

(from S. lacustris).

productus—w, S.

*maritimus—R.

Schoenus

nitens—w.

*brevifolius—R (r).

apogon—w, v.c.

foliatus—w, S.

(syn. S. axillaris).

tenuissimus—H.

Cladium

articulatum—R.

glomeratum—w.

acutum—w, H (v.c.).

juncum—w.

procerum—R.

(from C. mariscus).

*laxum—S.

(Near Long Swamp — a
new record for Victoria.)

Gahnia

radula—w.

tetragonocarpa—S.

Clarkei—w.

(not G. psittacorum of
Tasmania.)

Lepidosperma

gladiatum—R.

longitudinale—w, v.c.

*concavum—C.

laterale—w, S.

semiteres—w, v.c.

Neesii—O.

*carphoides—R (v.c.).

Tetraria capillaris—w, H
(v.c.).

(syn. Cladium capillaceum).

Gymnoschoenus sphaero-
cephalus—H (v.c.).

Caustis

pentandra—H.

flexuosa—H.

Chorizandra

cnodis—H.

cymbaria—C.

Carex

pressa—w.

inversa—w.

Gaudichaudiana—w.

breviculmis—w.

longifolia—R.

fascicularis—R.

(from C. pseudo-cyperus).

RESTIONACEÆ

Lepyrodia Muelleri—w, v.c.

Restio

complanatus—w, S.

tetraphyllus—w, S.

Leptocarpus

tenax—w, S (v.c.).

Brownii—w, S (v.c.).

Hypolaena

lateriflora—w, H.

fastigiata—w, H (v.c.).

CENTROLEPIDACEÆ

Brizula pumilio—O.

Centrolepis

polygyna—w, S.

glabra—w, S.

aristata—w, S (v.c.).

strigosa—w, S (v.c.).

XYRIDACEÆ

Xyris operculata—w, H.

JUNCACEÆ

Luzula campestris—w.

Juncus

*planifolius—w.

caespiticius—H.

bufonius—w.

*plchejus—?

polyanthemios—w, v.c.

pauciflorus—w.

vaginatus—w.

pallidus—w.

maritimus—R.

holoschoenus—w.

articulatus—S.

SPERMATOPHYTA (cont.)

LILIACEÆ

- Burchardia umbellata*—w.
Anguillaria dioica—w.
Bulbine
 bulbosa—O.
 **semibarbata*—O.
Thysanotus
 tuberosus—w.
 Patersonii—w.
Dichopogon
 strictus—w.
 fimbriatus—w.
Arthropodium
 milleflorum—w.
 (syn. *A. paniculatum*).
 minus—H.
Chamaescilla corymbosa—w.
Tricoryne elatior—H.
Cæsia
 vittata—w.
 parviflora—H.
Styandra glauca—H.
Dianella revoluta—w.
Bartlingia sessiliflora—w.
Lomandra
 longifolia—w.
 micrantha—O.
 filiformis—w, F.
 glauca—O.
Xanthorrhæa
 minor—w.
 australis—w.

AMARYLLIDACEÆ

- Hypoxis glabella*—w.

IRIDACEÆ

- Patersonia*
 glauca—w, S.
 longiscapa—S.

ORCHIDACEÆ (45 spp.)

- Dipodium punctatum*—F.
Gastrodia sesamoides—F.
Prasophyllum
 australe—H.
 elatum—H.
 Hartii—H (r).
 odoratum—H.
Calochilus Robertsonii—S.
Thelymitra
 antennifera—H (v.c.).
 flexuosa—S.
 grandiflora—H.
 ixioides—w.
 rubra—H.
 pauciflora—w, v.c.

Microtis

- unifolia*—w, v.c.
 parviflora—w.
 oblonga—H

Corybas

- unguiculatus*—w.
 dilatatus—w, v.c.
 diemenicus—w, v.c.

Acianthus

- exsertus*—w.
 reniformis—w, v.c.

Lyperanthus nigricans—H, R.

Eriochilus cucullatus—w.

Caladenia

- angustata*—F.
 clavigera—O.
 carnea—w.
 + var. *pygmaea*—H.
 deformis—H.
 dilatata—w.
 latifolia—O.
 Menziesii—w, v.c.
 Patersonii—H.
 + var. *suaveolens*—w, H
 (type from Portland).
 reticulata—O.
 + var. *valida*—O.
 (type from Portland).
 hastata—H
 (type from Portland).

Glossodia major—w.

Diuris

- pedunculata*—O.
 longifolia—w.

Cryptostylis subulata—S.

Pterostylis

- alata*—F.
 barbata—H.
 **decurva*—S.

(near Long Swamp; new
for S.W.).

- longifolia*—w.
 nutans—w.
 nana—w.
 pedunculata—w.
 parviflora—w.

CASUARINACEÆ

Casuarina

- stricta*—R.
 paludosa—w, H.
 + var. *robusta*—H.

URTICACEÆ

- Urtica incisa*—w.
Parietaria debilis—w.

SPERMATOPHYTA (cont.)**PROTEACEÆ**

Isopogon ceratophyllus—w. H.
Conospermum Mitchellii—w. H.

Persoonia juniperina—w.

Grevillea

Aquifolium—H.

**rosmarinifolia*—R (r).

Hakea

rostrata—w, H (v.c.).

nodosa—w, H (v.c.).

ulicina—H (r).

Banksia

marginata—w, v.c.

integrifolia—R (v.c.).

SANTALACEÆ

Exocarpus cupressiformis—w.

LORANTHACEÆ

Annyema pendula—w, F (v.c.).

Phrygilanthus eucalyptifolius
—F.

POLYGONACEÆ

Rumex

Brownii—w.

dumosus—O.

Polygonum

prostratum—S.

minus—w, S.

subsessile—S.

Muehlenbeckia adpressa—w.

CHENOPODIACEÆ

Rhagodia baccata—R.

Chenopodium pumilio—O.

(*not C. carinatum*).

Salicornia australis—R.

AMARANTHACEÆ

Trichinium macrocephalum—
O.

AIZOACEÆ

Tetragonia implexicoma—R.

PORTULACACEÆ

Claytonia australasica—w.

Montia fontana—O.

Portulaca oleracea—R.

CARYOPHYLLACEÆ

Stellaria pungens—w.

Sagina apetala—w.

Colobanthus apetalus—w, O.

Spergularia rubra—O.

RANUNCULACEÆ

Clematis

atistata—w.

microphylla—w.

Ranunculus

parviflorus—w.

rivularis—w, S.

lappaceus—w.

LAURACEÆ

Cassythia

glabella—w, H.

pubescens—w.

melantha—w.

CRUCIFERÆ

Cardamine

**dictyosperma*—?

laciniata—w, S.

hirsuta—w.

tenuifolia—w, S.

Hymenolobus procumbens—H.

DROSERACEÆ

Drosera

pygmaea—w.

**glanduligera*—H.

binata—w, H.

Whittakeri—w.

auriculata—w.

Planchonii—w, H.

CRASSULACEÆ

Crassula

Sieberiana—w, O (v.c.).

bonariensis—w, S.

macrantha—w, O.

recurva—w, S.

SAXIFRAGACEÆ

Bauera rubioides—w, S.

PITTOSPORACEÆ

Bursaria spinosa—w.

Billardiera

scandens—w.

cymosa—R.

ROSACEÆ

Rubus parvifolius—w, C.

Acacia

ovina—w.

anserinifolia—w, O.

LEGUMINOSÆ (36 spp.)

Acacia

armata—w.

myrtifolia—w.

pycnantha—O (v.c.).

**rhetinodes*—R, O.

stricta—w.

melanoxylon—w, C.

Mitchellii—w, v.c.

mollissima—w, O.

Oxycedrus—w, v.c.

verticillata—w.

Gompholobium minus—w, H.

Sphaerolobium vimineum—w,
H.

Viminaria juncea—w (r)

(syn. *V. denudata*)... "

Daviesia latifolia—F.

SPERMATOPHYTA (cont.)

LEGUMINOSÆ (cont.)

Pultenaea

prolifera—w.

(extension of range from
Otago).

pubescens—R, C.

recurvifolia—?

(confined to Vict., Port-
land area).

stricta—w, v.c.

scabra—R, C.

Dillwynia

glaberrima—w.

(not *D. ericifolia*).

*floribunda—w.

cinerascens—w.

Platylobium

obtusangulum—w.

triangulare—w, v.c.

Bossiaea

cordigera—w, S.

cinerea—w, H (v.c).

prostrata—w.

*riparia—R (r).

*Hovea heterophylla—C (r).

Goodia lotifolia

var. pubescens—w, C.

Lotus corniculatus—w, S.

Indigofera australis—w.

Psoralea adscendens—w, S.

Glycine

clandestina—w.

*Latrocana—O.

Kennedyia prostrata—w.

GERANIACEÆ

Geranium pilosum—w.

Erodium cygnorum—O.

Pelargonium australe—w.

OXALIDACEÆ

Oxalis corniculata—w.

LINACEÆ

Linum marginale—w.

RUTACEÆ

Uronia

pinnata—w, H (v.c.).

pilosa—w, H (v.c.).

polygalifolia—w.

palustris—w, S.

(many parts of Lower
Glencly—probably over-
looked by former col-
lectors).

Correa

reflexa—F.

+ var. rubra—w, v.c.

TREMANDRACEÆ

Tetratheca

ericifolia—R (r).

ciliata—w, v.c.

POLYGALACEÆ

Bredemeyera

volubilis—w, F.

calymega—w, H.

Poranthera

*ericoides—?

("Glencly Mouth" is only
record for Victoria).

microphylla—w.

Amperea spartioides—w, v.c.

STACKHOUSIACEÆ

Stackhousia

monogyna—w.

viminea—F.

SAPINDACEÆ

***Dodonaea attenuata**—R, O.

RHAMNACEÆ

Pomaderris

apetala—C.

*prunifolia—R, O.

subrepanda—C.

Spyridium

parvifolium—w.

voxilliferum—w.

MALVACEÆ

Plagianthus pulchellus—C.

STERCULIACEÆ

Lasiopetalum Schulzenii—?

(known from Cape Nelson,
near Porirua).

DILLENIACEÆ

Hibbertia

sericea—w, v.c.

stricta—w, v.c.

ovata—w, H.

*acicularis—R (r).

fasciculata—w, v.c.

GUTTIFERÆ

Hypericum

japonicum—w, S.

gramineum—w.

VIOLACEÆ

Viola

hederacea—w, v.c.

Sieberiana—w.

THYMELÆACEÆ

Pimelea

curviflora—w.

flava—w.

glauc—O.

humilis—O.

spathulata—w.

ligustrina—C.

octophylla—w, H.

phylicoides—w.

SPERMATOPHYTES (cont.)

LYTHRACEÆ

Lythrum Hyssopifolia—w, S.

MYRTACEÆ

Eucalyptus

Baxteri—w, v.c.

**leucosylon*—R (r).

*+ var. *macrocarpa*—O.
(apparently first record
for Victoria).

obliqua—R.

ovata—w.

camaldulensis—R.

(syn. *E. rostrata*).

vininialis—w.

vitrea—w.

Leptospermum

**flavescens*—?

scoparium—w.

pubescens—w.

(syn. *L. lanigerum*).

myrsinoides—w.

Kunzea pomifera—O.

(near telegraph line).

Melaleuca

squarrosa—w, S.

pubescens—R, O.

squamea—w, H, S (v.c.).

gibbosa—w, S.

Bækea ramosissima—H.

ONAGRACEÆ

Epilobium

Billardierianum—w.

(not *E. glabellum*).

juncum—w.

HALORAGIDACEÆ

Haloragis

tetragyna—w, v.c.

+ var. *decumbens*—C.

micrantha—w, H, S.

heterophylla—w, S.

exalata—C (r)

(previously known in Vic-
toria only from Curdie's
River, but also at Swan
Lake Falls).

digyna—w, H, S.

(nowhere east of Port-
land).

Brownii—w, S.

Myriophyllum

propinquum—w, S (v.c.).

verrucosum—H.

clatinoides—R.

Muelleri—H.

amphibium—C, S.

integrifolium—S.

UMBELLIFERÆ

Hydrocotyle

vulgaris—S.

hirta—w, v.c.

laxiflora—w, F.

tripartita—w, S.

callicarpa—w, H.

capillaris—w, O.

Centella asiatica—w, S.

Platysace heterophylla—w.

(syn. *Trachymene hetero-
phylla*).

Xanthosia

dissecta—w.

pusilla—w.

Eryngium

rostratum—S.

vesiculosum—w.

Oreomyrrhis andicola—w.

Apium australe—w, v.c.

Lilaeopsis australica—w, S.

Daucus glochidiatus—w.

EPACRIDACEÆ

Astroloma

conostephioides—w.

humifusum—w, v.c.

Leucopogon

australis—C.

glacialis—w, H (v.c.).

virgatus—w, v.c.

ericoides—w, v.c.

Acrotiche

serrulata—w, v.c.

prostrata—w.

cordata—R.

(a narrower-leaved form
than the coastal plant,
previously thought to oc-
cur only at Cape Bridge-
water).

Monotoca scoparia—w, H

(v.c.).

Brachyloma

**daphnoides*—O (r).

ciliatum—w.

Epacris

impressa—w, v.c.

lanuginosa—w, H.

Sprengelia incarnata—w, S

(v.c.).

PRIMULACEÆ

Samolus repens—R.

LOGANIACEÆ

Mitrasacme

paradoxa—w, F.

distylis—S.

Logania ovata—w, R.

PLATE VII



Fig. 1. Forest floor, near Port Moresby, New Guinea. (C. J. W. & W. J. W.)

Plate VII. Forest floor, near Port Moresby, New Guinea. (C. J. W. & W. J. W.)

SPERMATOPHYTA (cont.)

GENTIANACEÆ

- Sebaea*
 albiflora—S.
 ovata—S.
Centaurium pulchellum—w,
 v.c.
 (syn. *Erythraea australis*).
Villarsia exaltata—w, S.

CONVOLVULACEÆ

- Convolvulus erubescens*—w, O.
Dichondra repens—w, v.c.

BORAGINACEÆ

- Myosotis australis*—w, v.c.
Allocarya australasica—w.
 (syn. *Eritrichium austral-*
 asicum).
Cynoglossum suaveolens—w,
 O.

LABIATÆ

- Meibomia*
 laxiflora—w.
 australis—R.
 gracilis—C, R.
 saturejoides—C.
Prunella vulgaris—w.
Ajuga
 australis—w, O.
 grandiflora—O.

SOLANACEÆ

- Solanum*
 nigrum—w.
 aviculare—w.

SCROPHULARIACEÆ

- Mazus puntillo*—w, v.c.
Gratiola peruviana—w.
Glossostigma elatinoide—S.
Limosella aquatica—S.
Veronica
 Derwentia—w.
 gracilis—w.
 (incl. *forma gracillima*—
 from Panukin Creek).
 calycina—w.
Euphrasia collina—w, S.

LENTIBULARIACEÆ

- Utricularia*
 dichotoma—w, S (v.c.).
 lateriflora—w, S.
Polypompholyx tenella—w, S.

MYOPORACEÆ

- Myoporum*
 insulare—R.
 viscosum—R.

PLANTAGINACEÆ

- Plantago varia*—w, v.c.

RUBIACEÆ

- Coprosma quadrifida*—C.
Nertera reptaens—w, v.c.
Opercularia
 scabrida—w.
 varia—w.
 ovata—w.

- Asperula*
 scoparia—w.
 conferta—w.

- Galium*
 australe—w.
 umbrosum—w.
 Gaudichaudii—w, O.

CAPRIFOLIACEÆ

- Sambucus Gaudichaudiana*—w.

LOBELIACEÆ

- Lobelia*
 gibbosa—w.
 anceps—w.
 pratensis—S.

- Pratia*
 puberula—w.
 pedunculata—w, v.c.

CAMPANULACEÆ

- Wahlenbergia*
 gracilentia—w, O.
 quadrifida—w.
 **gymnoclada*—H.
 consimilis—R.

(N.B. All four spp. were
formerly included under
"W. gracilis.")

GOODENIACEÆ

- Goodenia*
 geniculata—w.
 humilis—w, S.
 ovata—w, C.
Scaevola microcarpa,
 var. *pallida*—w, O (v.c.).
Selliera radicans—w, S (v.c.).

BRUNONIACEÆ

- Brunonia australis*—w.

STYLIDIACEÆ

- Stylidium*
 graminifolium—w.
 despectum—w, S.
 perpusillum—H.
Levenhookia Sonderi—O.

COMPOSITÆ (38 spp.)

- Olearia*
 asterotricha—w.
 glandulosa—S.
 ramulosa—w, S.
 + var. *microphylla*—H.
Vittadinia triloba—O.
Lagenophora stipitata—w, v.c.

SPERMATOPHYTES (cont.)

COMPOSITÆ (cont.)

Brachycome

graminea—w.

parvula—O.

trachycarpa (?)—w, O (v.c.)

(abundant in Lower Glen-
elg-Swan Lake areas, ex-
tending to Cape Grant).

Siegesbeckia orientalis—C.

Cotula

coronopifolia—R.

australis—O.

reptans—w. v.c.

Centipeda Cunninghamii—w.

Craspedia uniflora—w.

Cassinia spectabilis—O.

Ixodia achilleoides—w. v.c.

*Millotia tenuifolia—O, F.

Podsetheca angustifolia—O.

Leptorrhynchus squamatus—
O.

Helichrysum

apiculatum—w.

*Baxteri—R.

Blandowskianum—w, v.c.

lerrugineum—w.

obtusifolium—w, H (v.c.);

scorpioides—w.

*Helipterum albicans—R (r).

Guaphalium

luteo-album—w.

involutum—w.

(not G. japonicum).

indutum—w. O.

Stuartina Muellieri—w.

Dreclithites

preanthoides—w.

arguta—w.

quadridentata—w, O.

hispidula—w.

Senecio

lautus—w. v.c.

(vich. var. pinnatifida).

odoratus—w, O.

Cymbonotus Lawsonianus—R,
O.

Micraseris scapigera—w.

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BIRDS OF THE LOWER GLENELG

By INA WATSON AND NOEL LEARMONTH.

The attached list records the birds observed on the sanctuary at the mouth of the Glenelg River and in the area which it is proposed shall be proclaimed a National Forest. Those marked with an asterisk were seen on the Easter excursion. N denotes the environs of Nelson; M, Moleside Creek watershed; R, Glenelg River; All, any part of the areas under discussion.

*Emu (*Dromaius nova-hollandiae*). N, R.

Stubble Quail (*Coturnix pectoralis*). N, M.

Brown Quail (*Synaeus australis*). N, M.

Painted Quail (*Turnix varia*). N.

*Common Bronzewing (*Phaps chalchopora*). All.

*Brush Bronzewing (*P. elegans*). N, M, R.

Banded Landrail (*Hypotaenidia philippensis*). All.

Black-tailed Water-hen (*Tribonyx ventralis*). N.

* Dusky Moor-hen (*Gallinula tenebrosa*). R.

Eastern Swamp-hen (*Porphyrio melanotus*). R.

*Coot (*Fulica atra*). R.

Little Grebe (*Podiceps ruficollis*). N.

Hoary-headed Grebe (*P. poliocephalus*). N, R.

Great Crested Grebe (*P. cristatus*). N.

Fairy Penguin (*Endiaptula minor*). N.

Short-tailed Shearwater (*Puffinus tenuirostris*). N.

Whiskered Tern (*Chidomias leucoparceia*). N.

- Caspian Tern (*Hydroprogne caspia*). N.
*Crested Tern (*Sterna bergii*). N.
*Silver Gull (*Larus nova-hollandiae*). N, R.
Turnstone (*Arenaria interpres*). N.
*Pied Oystercatcher (*Haematopus ostralegus*). N.
Sooty Oystercatcher (*H. unicolor*). N.
Red-kneed Dotterel (*Erythrorhynchus cinctus*). N.
*Spur-winged Plover (*Libinia nova-hollandiae*). N.
*Red-capped Dotterel (*Charadrius ruficapillus*). N.
Black-fronted Dotterel (*C. melanops*). N.
*Hooded Dotterel (*C. cucullatus*). N.
Double-banded Dotterel (*C. bicinctus*). N.
*Eastern Curlew (*Numenius eximius*). N.
Whimbrel (*N. phaeopus*). N.
Bar-tailed Godwit (*Limosa lapponica*). N.
Common Sandpiper (*Tringa hypoleuca*). N.
*Greenshank (*T. nebularia*). N.
*Red-necked Stint (*Erolia ruficollis*). N.
Sharp-tailed Sandpiper (*L. acuminata*). N.
Australian Snipe (*Gallinago hardwicki*). N, M.
White Ibis (*Threskiornis molucca*). N.
Straw-necked Ibis (*T. spinicollis*). N.
Yellow-billed Spoonbill (*Platalea flavipes*). N.
Royal Spoonbill (*Platalea regia*). N.
*White Egret (*Egretta alba*). N.
*White-faced Heron (*Notopharyx nova-hollandiae*). N, R.
White-necked Heron (*N. pacifica*). N.
Nankeen Night Heron (*Nycticorax calandonicus*). R.
Brown Bittern (*Botaurus poeciloptilus*). R.
*Black Swan (*Chenopsis atrata*). N, R.
Mand Goose (*Chenonetta jubata*). N.
Chestnut-breasted Shelduck (*Casarca tadornoides*). N, R.
*Black Duck (*Anas superciliosa*). N, R.
Blue-winged Shoveller (*Spatula rhynchotis*). N.
*Chestnut Teal (*Querquedula castanea*). N.
Grey Teal (*Q. gibberifrons*). N.
Hardhead (*Nyroca australis*). N.
*Musk Duck (*Biziura lobata*). N, R.
*Black Cormorant (*Phalacrocorax carbo*). N, R.
Little Black Cormorant (*P. ater*). N, R.
*White-breasted Cormorant (*P. fuscescens*). N.
Pied Cormorant (*P. varius*). R.
*Little Pied Cormorant (*Microcarbo melanoleucus*). N.
Gannet (*Sula servator*). N.
*Pelican (*Pelecanus conspicillatus*). N.
Spotted Harrier (*Circus assimilis*). R, M.
Swamp Harrier (*C. approximans*). N.
*Australian Goshawk (*Astur fasciatus*). All.
Collared Sparrow-hawk (*Accipiter cirrocephalus*). All.
*Wedge-tailed Eagle (*Uroaetus undatus*). All.
Little Eagle (*Hieraaetus morphnoides*). N, R.
*Whistling Eagle (*Haliaeetus sphenurus*). All.
*Peregrine Falcon (*Falco peregrinus*). R.
Brown Hawk (*F. berigora*). All.
*Nankeen Kestrel (*F. cenchroides*). All.
*Boobook Owl (*Ninox boobook*). All.
Rainbow Lorikeet (*Trichoglossus moluccanus*). R, M.
*Musk Lorikeet (*Glossopsitta concinna*). R, M.

- Purple-crowned Lorikeet (*G. porphyrocephala*). R, M.
 *Little Lorikeet (*G. pusilla*). R, M.
 *Yellow-tailed Black Cockatoo (*Calyptrorhynchus fuscatus*). R, M.
 *Gang-Gang Cockatoo (*Callocephalon fimbriatum*). R, M.
 White Cockatoo (*Kakatoë galerita*). R, M.
 Pink Cockatoo (*K. leadbeateri*). R.
 Galah (*K. roseicapilla*). R.
 *Crimson Rosella (*Platycercus elegans*). All.
 Eastern Rosella (*P. eximius*). R, M.
 Red-backed Parrot (*Psepholus haematonotus*). N.
 *Blue-winged Parrot (*Neophema chrysostoma*). N.
 Swift Parrot (*Lathamus discolor*). R.
 Ground Parrot (*Pezoporus wallicus*). N.
 Tawny Frogmouth (*Podargus strigoides*). All.
 *Azure Kingfisher (*Aleyone astra*). R.
 *Laughing Kookaburra (*Dacelo gigas*). All.
 Sacred Kingfisher (*Haleyon sanctus*). R, M.
 *Spinetailed Swift (*Hirundapus caudocinctus*). All.
 Fork-tailed Swift (*Micropus pacificus*). All.
 Pallid Cuckoo (*Cuculus pallidus*). All.
 Fan-tailed Cuckoo (*Cacomantis flabelliformis*). All.
 Horsfield Bronze Cuckoo (*Chalcites basalis*). All.
 *Welcome Swallow (*Hirundo neovena*). All.
 Tree Martin (*Hylochelidon nigricans*). All.
 Fairy Martin (*H. oriel*). All.
 Jacky Winter (*Microeca fascians*). All.
 *Scarlet Robin (*Petroica multicolor*). All.
 *Flame Robin (*P. phoenicea*). All.
 Hooded Robin (*Melanodryas cucullata*). N, M.
 *Yellow Robin (*Eopsaltria australis*). R, M.
 *Grey Fantail (*Rhipidura flabellifera*). All.
 *Rufous Fantail (*R. rufifrons*). R, M.
 *Willie Wagtail (*R. leucophrys*). All.
 Satin Flycatcher (*Myiagra cyaneoleuca*). M.
 *Restless Flycatcher (*Scisura inquieta*). All.
 *Black-faced Cuckoo-Shrike (*Coracina nova-hollandiae*). All.
 Little Cuckoo-Shrike (*C. robusta*). M.
 White-winged Triller (*Lolage tricolor*). All.
 *Spotted Quail-Thrush (*Cinclusoma punctatum*). M.
 *Striated Field-Wren (*Calamanthus fuliginosus*). N.
 Brown Song-Lark (*Cinclorhamphus cruralis*). N, M.
 Rufous Song-Lark (*C. mathewsi*). N.
 Australian Ground-Thrush (*Oreocinclu lunulata*). R, M.
 *White-fronted Chat (*Epthianura albifrons*). All.
 Australian Reed-Warbler (*Acrocephalus australis*). R.
 *Golden-headed Fantail-Warbler (*Cisticola exilis*). N.
 *Little Grass-bird (*Megalurys graivineus*). N.
 *Speckled Warbler (*Chthonicola sagittata*). N.
 Little Thornbill (*Acanthisa nana*). R, M.
 *Brown Thornbill (*A. pusilla*). All.
 *Striated Thornbill (*A. lineata*). M.
 *Chestnut-tailed Thornbill (*A. uropygialis*) or Red-tailed Thornbill (*A. harrisi*). N.
 *Yellow-tailed Thornbill (*A. chrysorrhoa*). All.
 Buff-tailed Thornbill (*A. reguloides*). M.
 *White-browed Scrub-Wren (*Sericornis frontalis*). All.
 *Superb Blue Wren (*Malurus cyaneus*). All.
 *Southern Emu-Wren (*Stipiturus malachurus*). N.

- *Rufous Bristle-bird (*Dasyornis broadbenti*). All.
- White-browed Wood-Swallow (*Artamus superciliosus*). All.
- *Dusky Wood-Swallow (*A. cyanopterus*). All.
- *Magpie-Lark (*Grallina cyanoleuca*). All.
- *Grey Shrike-Thrush (*Colluricincla harmonica*). All.
- *White-backed Magpie (*Gymnorhina hypoleuca*). All.
- Grey Butcher-bird (*Cracticus torquatus*). R, M.
- *Eastern Shrike-Tit (*Falcunculus frontatus*). M.
- *Golden Whistler (*Pachycephala pectoralis*). N, M.
- Rufous Whistler (*P. rufiventris*). N, M.
- *Olive Whistler (*P. olivacea*). N.
- *Eastern Whiteface (*Aphelocephala leucopsis*). N.
- *Orange-winged Sittella (*Neositta chrysoptera*). M.
- *Brown Tree-creeper (*Climacteris picumnus*). R, M.
- *White-throated Tree-creeper (*C. leucophaga*). All.
- *Grey-backed Silvereye (*Zosterops lateralis*). All.
- Red-tipped Pardalote (*Pardalotus ornatus*). All.
- *Spotted Pardalote (*P. punctatus*). M.
- *White-naped Honeyeater (*Meliphaga lunata*). All.
- *Brown-headed Honeyeater (*M. brevirostris*). M.
- *Eastern Spinebill (*Acanthorhynchus tenuirostris*). All.
- Tawny-crowned Honeyeater (*Gliphila melanops*). N, M.
- *Singing Honeyeater (*Meliphaga viridescens*). N.
- *Yellow-faced Honeyeater (*M. chrysops*). M.
- *White-eared Honeyeater (*M. leucotis*). All.
- White-plumed Honeyeater (*M. pentellata*). N, M.
- Crescent Honeyeater (*Phylidonyris pyrrhoptera*). M.
- *Yellow-winged Honeyeater (*Melioris nova-hollandiae*). All.
- Noisy Miner (*Myzantha melanoccephala*). M.
- *Red Wattle-bird (*Anthochaera carunculata*). N.
- Little Wattle-bird (*A. chrysoptera*). M.
- *Australian Pipit (*Anthus australis*). N.
- Beautiful Firetail (*Zonarghinthus bellus*). M.
- *Red-browed Firetail (*Acyhula temporalis*). All.
- *Raven (*Corvus coroneides*). All.
- *White-winged Chough (*Corecorax melanorhamphus*). R, M.
- Pied Currawong (*Strepera graculina*). N, M.
- *Black-winged Currawong (*S. melanoptera*). All.

SOME BIRDS OF THE PROPOSED GLENELG NATIONAL FOREST

By NOEL F. LEARMONTH, Tyrendarra, Vic.

The party of naturalists who visited Nelson at Easter to inspect portion of the area which it is proposed to reserve as a National Forest took note of the various forms of wild-life seen on the trip.

Local bird-lovers led by Mr. Eric Simson, R.A.O.U., have listed 164 species for the area, and despite the departure of the majority of migrants the visiting naturalists recorded 87 of these. The following species are worthy of special note:

Emu. Up to 40 of these birds were seen, most of them along the Portland-Nelson road; there the species is quite common.

Coot. Several birds seen in the reed-beds on various reaches of the river. Apparently they stay all the year and do not migrate.

Pied Oystercatcher, Sea-Curlew, Red-necked Stint and Green-shank were all seen on the sanctuary at the Glenelg estuary. They seem to have been lingering very late in southern climes.

White Egret. Common on all the S.W. waterways during autumn and early winter.

Pelican. Wonderfully quiet on the mud banks of the lower reaches.

Wedge-tailed Eagle. There are not many bends of the river where these noble birds are not seen overhead. Several nests were observed on large trees on the top of the high cliffs that form the Glenelg Gorge.

Peregrine Falcon. Nests on the high limestone cliffs.

Gang-Gang Cockatoo. Does not come near the sea, but is numerous up river and in the big timber on the Moleside Creek.

Pink Cockatoo. Two birds were seen by Miss Watson on a large Red Gum near the Moleside-Glenelg junction in 1937. Four birds were seen last April in the Portland district, but not on the Glenelg.

Blue-winged Parrot. Flocks on the treeless limestone and sandy rises on the S.W. portion of the area.

Ground Parrot. Though this bird was not seen by the party, Eric Simson had flushed a specimen two days before, and other local residents report having seen the parrot recently. It inhabits a dense growth of rushes, sedge and stunted bushes that stretches for miles on both sides of the Glenelg mouth, country full of bird-life which needs thorough ornithological inspection. Much of this is sanctuary and the Ground Parrot should survive and increase.

Azure Kingfisher. Only two birds seen by the party, but not uncommon anywhere along the river.

Rufous Fantail. One bird seen, but in spring and summer the species is well represented in the thick fern gullies of the Moleside Creek and tributaries. This is the farthest west that the bird has been recorded.

Spotted Quail-Thrush. A common species in the forest west of Portland. Seen by the party in thick scrub near Gallas Creek, north-east end of the reserve.

Striated Field-Wren. Several birds in the tall sedge bushes round the Glenelg mouth.

Golden-headed Fantail-Warbler. Lives in flocks of up to 30 birds along the south-west coast in similar country to that of the Ground Parrot. Only two birds were seen on the recent trip but there are several colonies of *Cisticola* known nearer Portland, where the species appears to be very local.

Speckled Warbler. Yet another species of the thick rushes and sedges: generally in company with *Calamanthus*.

Chestnut-tailed Thornbill or Red-tailed Thornbill. While searching for the Ground Parrot, Eric Simson, Cliff Beaglehole and

the writer flushed two small birds, evidently Thornbills. One dived into a thick stunted bush. We surrounded this and could almost touch the bird, but could not get a clear view except to identify it as one of the above. As both are out of their range, the matter needs clearing up.

Emu-Wren. These beautiful little birds are in considerable numbers all through the thick growth of the country behind the coastal sand-hills. When located, the searcher should stand quite still and soon the female will come to the top of their hide-out, look round, then hop back into the bush and return to view with the male.

Eastern Shrike-Tit Seen in the thick gullies of the Moleside Creek watershed.

Olive Whistler. When Mr. Jack Jones visited the area in February he heard a bird calling strongly from thick tea-tree and warble scrub close to the coast. One call was suggestive of the Rufous Whistler's "ee-chong" note, but more drawn out and somewhat plaintive. The tangle of climatis in the scrub soon stopped his progress in search, but not before he caught a glimpse of the bird close to the ground giving its mournful "ee-chong" call. He was convinced it was a Whistler, but the species remained a puzzle until he discussed the observation with Mr. Herbert Condon, ornithologist of the South Australian Museum. Only a few months previously Mr. Condon had collected several specimens of the Olive Whistler in similar scrub near Port Macdonnell, about 17 miles along the coast. It now seems reasonably certain that the Olive Whistler occurs in the coastal scrub at Nelson. More investigation is needed. The bird was heard by the Easter party whenever they were in that class of country, but none of us saw the Whistler.

Honeyeaters. Eight species were identified, none worthy of special notice except the Singing Honeyeater, which appears to live and nest closer to the sea than any other land bird of the area.

Bell-Miner. This species is entered on the authority of the Official Checklist of the Birds of Australia.⁴ In this publication the Bell-Miner is reported from "Glenelg River near coast and mountains."¹

Black-winged Currawong. One of several unexpected northern species found in the Portland district. It is common in the Glenelg and Moleside area and even a few miles east of Portland.

⁴The statement in the *Checklist* (1926) was probably based on a paragraph in *The Emu* for 1924 (Vol. 24, p. 157) in which Mr. C. E. Simson reported having seen in May of that year a flock of about 30 Bell-Miners on the Glenelg River some 18 miles north of Casterton. The writer made the point that this was probably a western record for the species, and added that it would be interesting to see if the birds established themselves in suitable country 40 miles or so farther down the Glenelg. Unless that hope has been fulfilled the species cannot be credited to the Nelson National Forest.—EDITOR.

WHAT, WHERE AND WHEN

Forthcoming Excursions, etc.

General Excursions:

Saturday, August 16.—Zoology School, University. Subject: "General Zoology." Leader: Professor W. E. Agar. Meet 2.30 p.m. at main entrance to Zoology School.

Saturday, August 23.—North Williamstown. Subject: "Introduction to Marine Life." Leader: Mrs. J. J. Freame. Meet 2.30 p.m. at North Williamstown Railway Station. (Fare from Flinders St. 9⁴d., 2nd class return). Bring collecting jar, notebook, pencil, etc. Note: Formation of a Marine Biology Discussion Group will be discussed at this excursion.

Saturday, August 30.—Sir Colin Mackenzie Sanctuary, Healesville. "World Bird Day." Leader: Mr. A. H. Chisholm, F.R.Z.S. Bus leaves Batman Avenue at 9.30 a.m. Bring two meals. Bus bookings, 6/- (including admission to Sanctuary), with Mr. H. C. E. Stewart (Tel. FU 022; Ext. 457).

Saturday, September 6.—Blackburn Lake. Subject: "How To Collect Insects." Further particulars at August general meeting.

Sunday, September 7.—Balcombe Bay, Mornington. Subject: "Tertiary Fossils and Foreshore Botany." Bus leaves Batman Avenue 9.15 a.m. Bus bookings, 5/6, with Mr. A. A. Baker, 53 Carlisle Street, Preston.

Preliminary Notice of General Excursions:

Show Day (September 25).—Club Picnic to Anakie Gorge. Bus bookings, 7/6, with Mr. H. Preston (Tel.: Haw. 1853).

Bendigo Week-end (by parlour coach), October 25-26. Approximate inclusive cost, 50/- to 55/-. Early reservation desirable, as accommodation limited. Bookings with Leader, Mr. H. C. E. Stewart (Tel. FU 022; Ext. 457).

Group Fixtures:

Saturday, August 9.—Geology Group. National Museum. Subject: "Mineral Tests, Part II." Meet Russell Street entrance, 2 p.m.

Saturday, August 9.—Botany Group. Heathmont. Subject: "Native Flowering Plants." 1.38 p.m. train from Flinders Street to Heathmont. Fare, 1/2⁴, 2nd class return.

Monday, August 25.—Botany Discussion Group. Royal Society's Hall, 8 p.m. Subject: "Legumes of the Spring," by Mr. A. J. Swaby.

Tuesday, September 2.—Geology Group. Royal Society's Hall, 8 p.m. Subject: "Tertiary Fossils," by Mr. A. N. Carter.

Monday, September 22.—Botany Discussion Group. Royal Society's Hall, 8 p.m. Subject: "Census of Victorian Plants," by Mr. J. H. Willis, B.Sc.

Special Notice.—Excursion Sub-committee are framing 1948 Syllabus of Excursions and would welcome suggestions for excursions and volunteers as sponsors.

A. A. Baker,
Excursion Secretary.

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PROCEEDINGS

The monthly meeting of the Club was held on August 11, 1947, the President (Miss Ina Watson) and about 250 members and friends attending.

The following were elected as Ordinary Members: Miss Patricia Wilson, Miss A. M. Morton, and Mr. B. E. Schubert.

The subject for the evening was a colour film of the Great Barrier Reef, taken by Mr. T. W. Gummerson, who showed also a short film of general interest. The Barrier Reef film was of outstanding interest, as it showed some of the rarer reef-living animals (nudibranchs, mollusca, sea-slugs, etc.) going about their normal affairs. The nudibranchs and their method of swimming were new to most members.

A vote of thanks was proposed by Mr. P. Crushie Morrison, seconded by Miss Lynette Young, and carried with acclamation.

EXHIBITS

Mr. Ivo Hammet: Garden-grown native plants, including *Acacia farinacea*, *A. spinescens*, *Grevillea lavandulacea*, *G. obtusiflora*, *Eucalyptus Kruseana*, *Templetonia retusa*, *Sholtzia oligandra*, *Hakea sulcata*, *Daviesia brevifolia*.

Mr. J. S. Seaton: *Grevillea lavandulacea*, garden-grown at Caulfield.

Mr. A. N. Carter: Barrier Reef shells, including *Paphia literata* Linn.; *Cardium unedo* Linn.; *Tellina virgata* Linn.; *Pyrasus herculeus* Mart.; *Terebra dimidiata* Linn.; *T. subulata* Linn.; *Conus ciliatus* Linn.; *C. marmoreus* Linn.

Mr. Frank Child: Orchid, *Corybas dilatatus*.

Mr. J. R. Garnet: *Dendrobium teretifolium* R.Br.: in flower.
Miss E. Raff: *Acacia leprosa*, garden-grown.

Mr. S. R. Mitchell: Flaked pebble implements and stone artifacts from Lake Illawarra, N.S.W.

Mr. F. S. Colliver: Early book on Corals, *The Natural History of Zoophytes*, by Ellis (1788).

NEW DIRECTOR OF ADELAIDE BOTANIC GARDENS

Mr. Noel Lothian, a member of the F.N.C.V. since April, 1934, and now Lecturer in Horticulture at Lincoln College, Christchurch University, N.Z., has received advice of his appointment to the directorship of Adelaide Botanic Gardens—a position that will take official effect as from the end of the present year. Fellow-members rejoice in this further mark of honour to Mr. Lothian's already distinguished career, extending to him their united congratulations and warmest wishes for the work in Adelaide, which should prosper under the youthful vigour, enthusiasm, and extra-Australian experience that he brings to enhance it.

PROTECTION—AND YOU

By INA WATSON, President V.F.N.C.

Letters to the Committee and comments at meetings of the F.N.C. reveal that there is a very real interest among members in regard to the safeguarding of flora and fauna. At the suggestion of the Committee, these notes are written for information and guidance.

A printed list of animals (which of course includes birds) protected by law is obtainable from the Fisheries and Game Dept., 605 Flinders Street. A list of protected plants can be had on request from the Forests Commission, Treasury Gardens. (This protection extends only to flowers on Crown Lands, not on private property.) All members should see that they have a list for reference.

If a breach of the law is observed, report full details to the nearest police station, if possible getting the officer to see for himself. The police can then take action. It may be possible, in some circumstances, to contact an inspector attached to the Departments mentioned: one is occasionally on duty at the main Markets, for instance. Additional inspectors, known as honorary rangers and/or inspectors, who carry a special card of authority, wear a distinctive badge, and have the same powers as a departmental inspector, are appointed by the State Executive. Their ranks include a number of members of this Club. They have authority to demand names and addresses, etc., and to stop the picking of protected flowers.

But it is not always possible to get such help conveniently, and members are more likely to see breaches of the law when out on field-work. In this event no private individual has any *legal* right to interrogate the law-breaker (what the member does as an individual is entirely his or her own concern), but you should note all you can and report the incident fully to the appropriate Department later. It may not be possible, for example, to obtain a full name and address, but if a vehicle is being used, note its colour, make, type and number; the Departments have means for tracing it later, and will take action if possible. Give time, place, district and all relevant details.

(If any member wishes to take specimens for study purposes, a permit should be obtained from the Forests Commission, and on any excursion of the Club the leader should be told that the member holds such a permit. It should be noted that, each year, the Club obtains a special covering permit for wild flowers collected for the Nature Show.)

When cruelty is involved, remember that you must prove "legal" cruelty, and this is difficult because the law does not always state specifically what cruelty is: for example, it does not state how

many birds of a certain size may be confined in a cage of definite dimensions, and if the number is exceeded it can be regarded as cruelty. But if you consider that there are definite grounds for action, then contact the police or an officer of the Victorian Society for the Protection of Animals. If time or circumstance does not permit this, be sure to get another witness; one person's evidence is not sufficient. Report to the V.S.P.A. or to the police.

In regard to animals or flowers that are not protected by law, you can protest as an individual through the Press (and, so help to form public opinion), and you can give full details to your Committee for them to take official action if they consider it desirable. In any event the notes will be filed for reference for supporting evidence when authorities have to be approached.

Members should know of matters in which the Committee has acted recently:

Killing of Wedgetail Eagle by an archer: A letter of protest was sent to both the individual and the Club to which he belongs.

Cruelty to birds used as targets by Gun Club: An official letter was sent to the Press and contact made with the V.S.P.A. A deputation to the responsible Minister will probably be made, and with this the Club will be associated.

Exportation of fauna overseas: Letters were sent to the Zoological Board of Victoria and the Zoological Society of N.S.W. asking for their help in getting the practice checked. A strong letter was sent also to the Minister of Customs asking that permission be refused where it was a question of a monetary transaction, and that where it was considered desirable to exchange fauna this should be kept to a minimum, and then only with recognized zoological bodies where it was known that the animals would be well cared for in transit and on arrival. It was pointed out that this Club did not approve, on principle, with the confining of animals, and considered that the export of fauna should be prohibited unless under the most rigid supervision and in exceptional circumstances.

Wimmera lands and eucalyptus distilling: A tract of 1600 acres on the northern boundary of the Little Desert is one of the few areas left in the Wimmera where the Lowan can be found. Mr. Muir (of Dimboola) sent details of an application by private individuals for the eucalyptus oil rights over this area. They planned to roll the mallee so that the second-growth leaves might be harvested. This, of course, would have meant that the area would be ruined as a habitat for the Lowan. Protest was made to the Forests Commission on this ground, and it was pointed out that private property was available for leasing for eucalyptus harvesting. The R.A.O.U. has agreed to co-operate with the Club and it is hoped that the application will be refused.

National Parks, etc.: Members will know that these matters are in the hands of the Sub-Committee for National Parks and Monuments, and that these members do not lose an opportunity to further the matter. At present they are waiting until officers are appointed to the Land Utilization Board (under legislation enacted recently), and this Board formulates and announces its policy. The August *Vic. Nat.* gave full details of the area proposed as a Forest Reserve in the Glenelg River district. The Club is taking an active part in this project.

Individual obligation: It is suggested that you, as an individual member, can help in the following ways:

1. Be punctilious yourself in observing the law.
2. Write to your own M.L.C. or M.L.A. suggesting a constructive policy.
3. Make your own views known among acquaintances and ascertain theirs. Particularly, bring your influence to bear upon country people and Press. The opinion of the person on the spot counts most of all.
4. Be prepared to help in every way possible to extend the knowledge which will bring appreciation of our fauna and flora.

A NOTEWORTHY PLANT CATALOGUE

Garden-lovers frequently get absorbed in nurserymen's catalogues. This journal does not customarily review advertising publications, but the issue of a catalogue devoted exclusively to Australian plants assumes an importance that demands acknowledgement. *Australian Native Plants*, 1947, from Nindethana Nursery, Dripstone, N.S.W., interests all concerned with the preservation of our flora, also those loyal Australians who wish for an unusual native plant or two in their gardens. The proprietor of the nursery, Mr. G. W. Althofer, with his brother, is widely known for conspicuous success in the propagation of native plants. The nursery has issued lists previously, but the latest impressive compilation bears testimony to unique enterprise and industry.

Well illustrated, with captions (in those several members of F.N.C.V. have co-operated), and a brief foreword prefacing a wide range of plants, many being rare kinds, this 40-page catalogue will delight the botanically-minded. It would be invidious to select from the riches offered, but allusion should be made to *Gossypium Sturtianum* (pictured in *Vic. Nat.* for May, 1947), and the varied *Eucalyptus* section.

Mr. Althofer is commended for his work, truly of national value, which has not brought him financial reward. The nursery aims to build up an arborescens of hardy Australian plants, to preserve them from possible extinction. Already over 1,000 species have been successfully cultivated. Assistance from F.N.C.V. members in collecting seeds of rare species, especially those threatened with obliteration, would be appreciated by Mr. Althofer. Further, members could bring under notice of their municipal councils and tree-planting bodies the extensive arboreal native stock the Nindethana Nursery can supply. Those interested may communicate direct with Mr. Althofer, who will forward his catalogue for 1/11 posted.

H.C.E.S.

MEMORABLE OCCURRENCES AMONG BUDGERIGARS

By EDITH COLEMAN, Blackburn, Vic.

Like most nature-lovers I have witnessed many memorable incidents among birds and other creatures; but I think the night singing of budgerigars will always be my loveliest memory.

With farmers and gardeners, birds must have been sighing for rain during the unusually long spell of May sunshine this year. At 7 p.m. on May 23 rain fell and our budgerigars appeared to rejoice. During a lull in the heavy downpour my daughter called me to hear them singing while the rain was still pattering. She

had heard them above the sound of heavy rain; with the wireless on, through a closed window some 25 ft. distant from the birds. We listened for a little while through the open window, then went out to the aviaries.

It was quite dark but the "budgies" sang on. The usual sounds that call us out to the birds are cries of alarm or a noisy fluttering when something has frightened them; but this was—how different! The united voices of some 130 comfortably-sheltered birds were singing in the rain. The sweet, clear notes suggested the ripple and gurgle of water, or the patter of the rain itself—a full chorus rejoicing over



Ishmael, a cobalt Budgerigar, male.

the breaking of a Maytime "drought."

One has no words to convey adequately the wonder and beauty of that night chorus. We could not have spoken, had we wished, as we stood there in the dark, listening to Australia's cheeriest birds singing their song of the rain. It brought a fuller realization of what rain must mean, under natural conditions, to these merry little birds.* It was eloquent of their rejoicing at the end of a long dry spell, or the breaking up of a real drought, and the springing and seeding of the grasses they love.

*Apparently the vocal reaction of parrots to rain was known long ago, although the impression then seems to have been that the birds were not pleased by the falls. At any rate, Shakespeare caused Rosalind to assure Orlando that when they were married she would be "more jealous than a Barbary cock-pigeon over his hen; more clamorous than a parrot against rain . . ."—Editor.

What a difference in the air they must have sensed to call forth such a paean of praise! It is almost pathetic to note their delight in freshly-gathered moist grasses.

Something of what rain must mean to them may be surmised from their joy when a garden spray is directed into their houses. The sound of the sprinkler draws them fluttering hopefully to the wires. They dash in and out with open, beating wings until they are soaked.

A clump of wet grass, taken with a spit of earth, fills them with ecstasy. They tumble through the green blades until not a drop of moisture can be left on them. A bunch of cut grass is treated in the same way until the whole is scattered.

Like other birds in natural conditions budgerigars would bathe by darting in and out of dew and rain-wet branches. This was revealed by their instinctive knowledge of what to do with wet gum-twigs hung on the wires—cage-bred birds which had never seen or felt a dew-laden tree!

The nibbled and frayed leaves of both wattle and gum leaves suggest that budgerigars are not so dependent on grasses as we had thought. Gum leaves are eaten to the midribs. *Casuarina* (she-oak) they love. In natural conditions these are probably a staple food. They love the unopened buds of wattles, but here we go cautiously, although, according to Ewart, there is only one poisonous species of *Acacia*. They would probably nibble the bark of these trees as they nibble apple-bark, especially at nesting time.

They revel in damp humus gathered up from under the trees and placed in their houses.

Modern research into moulds suggests that the birds find in humus something essential to their welfare. Almost every day fresh, seeding grasses are given to our birds, one or other species being in flower throughout the year. They are especially fond of shell-grass (*Brisa maxima*) and this may well have suggested the name Shell-parrot—the flower-spikes of the plant somewhat resemble shells.

Children call the little black winkle (*Nerita*) common on rocks uncovered at low tide, "Budgie Shells," having noted their resemblance to the head of the budgerigar. The curve of the whitish apex, on the very slight spire, often with "zebra" stripes, does indeed resemble the budgerigar's down-curving bill.

Other favourite grasses are rat-tail (*Sporobolus capensis*), paspalum, panicum and canary-grass (*Phalaris*).

At 6 p.m. on May 27 more rain fell after 27 days of almost continuous sunshine. The birds commenced singing at 8.45 p.m. and were heard above both rain and wireless. They sang for 30 minutes. They sang again on May 29 at 9.30 p.m. It was a cold but moonlit night. No rain fell.

On May 30 they did not sing, but on the 31st they sang, in the moonlight, at 7.45 p.m., but ceased after a few moments and fluttered noisily as if frightened. They went on again at 8.30 for ten minutes (A frogmouth was seen flying near the cages on two of these moonlit nights.) We wondered whether the wireless influenced them but they sang again on June 1 when this was silent and there was no rain.

On June 2 (moonlight) they commenced at 9.25 p.m. It was so cold that I went into the house for a wrap. I switched off the wireless, but the singing was sustained until 9.50 p.m. The next two nights were foggy, with the moon overcast. We have not heard them since.

The singing always commenced suddenly as if in response to a conductor's baton, and it ceased abruptly, like the switching off of a wireless chorus. Doubtless others have noted this delightful night singing, but I have never heard of it. Magpies and willie wagtails are often heard at night. Possibly, too, like song-thrush and blackbird, many birds sing in the rain, but are only heard when there are a sufficient number of voices in the choir to render a far-reaching volume, as in the dawn chorus.

As one watches these cheery little birds day after day, one learns to read signs of pleasure or distress: sounds of satisfaction over newly-filled feeding-dishes; contented sounds at noon when they settle for a quiet siesta; restless sounds when they seek nests, or ask for less crowded quarters.

Perhaps the most surprising feature of budgerigars is their almost incredible fecundity. Not quite so surprising, perhaps, when one considers how hardy (perhaps adaptable would be a better word) they are, thriving happily in almost any climate and under any reasonable conditions. Their cheery prattle breaks through excessive heat or cold, or the cruelly-small cage of the bird-fancier.

In 20 months our six budgerigars have increased to 130, a fecundity I can only compare with that of some white mice I kept, and which I attributed to the vitamins in living herbs and fresh seeds on which they were fed.

One of our six birds, a male, did not secure a mate, but, as two females were appropriated by another male, this cancelled out. His was the only death among our adult birds. He apparently dashed into a wire when frightened by some night prowler. Next morning he was found with a broken neck. Ishmael we called him. He spent his days in peering into the happy homes of the others, feeding their young when opportunity offered, and taking many rebuffs from irate mothers.

This has been an exceptionally warm winter so far, and to the present date (June 9) there has been no cessation of breeding activities among the budgerigars. Except for feeding, the birds

have been left to themselves, to live as nearly as possible as we think they would live in natural conditions. Nesting boxes have not been cleaned for them. On June 3 there were still eggs and young in the nests. On that day a fully-fledged young one emerged and a young bird was hatched. Experienced breeders would have removed the nests long ago.

Late-hatched young are often weaklings, or "runners." We have had neither. There were three young with feet so widely spread that they perched with difficulty, but they seemed perfectly healthy and flew easily to the perches. They were not kept, as we felt that they were handicapped for taking the rough and tumble of a crowd. Two of these were from a nest in which the mother sat so closely that she was rarely seen. It is possible that these young had no chance to exercise their feet, for their mother was always on eggs and/or young. The other came from a crowded (orthodox) nesting box in which there were two mothers and their families, so the deformity may have been caused in the same way.

There seems to be a desire to hurry late broods out of the nest so that another brood may be reared. Several young have been so badly treated in this way that they had to be destroyed.

Courtship appears never to cease. There is still much love-making (billing, preening and feeding). Until June 4 one mother was sitting on three eggs in what must have been her fourth or even fifth clutch. One of her last brood emerged on June 3. She and her mate, who was the father of her three broods last season, are still ardent lovers. For long periods she would sit with her head through the opening of the nest for him to preen, and she, in turn, performed the same office for him. They now perch side by side, billing and preening as in the heyday of their "love's young dream."

Usually the males are drowsy and inactive while their mates are brooding. They perch dejectedly until the emergence of the mothers reanimates them. The hatching of the first egg galvanizes them into new life. From then on the male shoulders the greater part of the feeding of mother and young.

This season it was not possible to buy standard nesting-boxes, so cheese-boxes were used. These proved more popular and in some respects much better than the orthodox box.

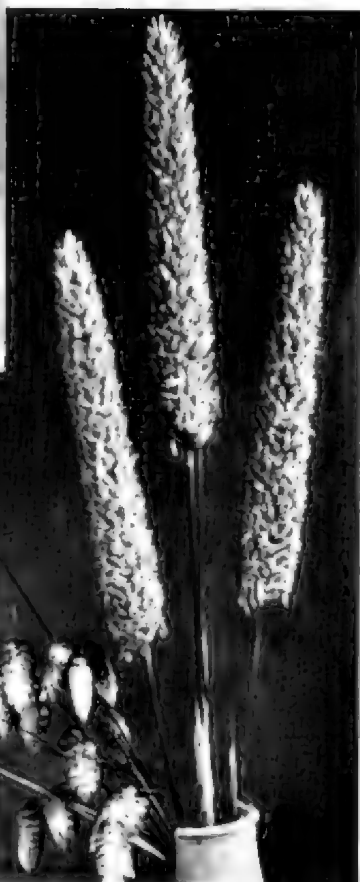
Four birds have escaped through open doors. Two of these returned to the wires after a day's freedom and were easily recovered.

There has been no regimentation—no interfering with love-matches, with the foregoing result. One no longer marvels that the race is able to survive the terrible holocausts during heat waves and water shortage. Nature allows for great losses in a wildly extravagant fecundity, as in the cases of certain insects and animals such as mice and lemurs.

PLATE VIII



Gum leaves after an
hour in the cages of
Budgeenigars.



Seedling grasses, favourite
foods of Budgeenigars.
Left: Shell grass. Right:
Canary grass.

There is an old story that in the Moluccas one may not approach a clove tree wearing a hat, lest the tree bear no fruit. Our budgerigars, too, take alarm if I approach the aviaries wearing a hat. I may have to adopt this means of slowing down increase!

Colour changes, always a fascinating aspect of bird-breeding, becomes an engrossing game when budgerigars are the subject, but this must be another story. We have kept our mild-greens (cage-bred, of course) separate, and these delight me more than the yellows, blues, cobalt, etc., lovely as they are.

The mild-greens are a part of our sunny land. They speak of sunshine and open spaces. To see these green and gold jewels darting in and out of wet gum twigs calls up a picture of the inland, or the Mallee, when farmer and birds rejoice together over a long-delayed rainfall.

A bunch of grass hung on the wires instantly "blossoms" with birds, just as a dead tree appears to burst into fresh green foliage when wild budgerigars alight on every branch and twig (A. H. Chisholm, *Emu*, 1909).

I should like to emphasize the fondness of these birds, not only for grasses, but gum leaves, wattle phyllodes and she-oak branchlets, and possibly for many other plants. Here we must go cautiously. In a wild state, moving over a wide range, with a wider range of plants to choose from, the budgerigars would doubtless eschew the leaves of harmful plants.

The leaves of the Cootamundra wattle are not taken but the flower-buds are eaten greedily: but grasses are taken first—and to these living, seeding grasses (and Vitamin E) I think we must attribute the surprising fecundity of our birds.

EXCURSION TO CLARINDA

From East Oakleigh Station, on May 17, the route taken was along the straight lane southward a mile to Clarinda, thus giving opportunity to observe clearly the alternations of different vegetations on the slight sandy rises and the intervening moister situations, *Leptospermum myrsinoides* being a typical plant of the drier sand-hills and *Melaleuca* in the damper ground.

Few plants were in flower, but the Silver Banksia (*B. marginata*) made a fine show, this being within its normal flowering season. Other noteworthy features were an extensive carpet of *Setihera* on an area liable to submergence, and vigorous vegetative growth of a patch of the Tiny Sundew (*Drosera pygmaea*), some of the very slender fruit stalks of the previous flowering being still present.

The growth of this Sundew at this season is probably unusual and due to favourable conditions of this year. On search, later, a few examples were also found at Croydon—not so vigorous. Information is lacking as to the frequency of such autumn growth of this plant.

In the lanes near Clarinda School a search was made for a plant of *Casuarina paludosa* carrying both staminate and pistillate flowers, but it was not located, though a specimen found some time ago was supposed to have come from here.

T. S. HART.

NEW BEES AND WASPS—PART VI

An Undescribed *Paracollotes* from the Victorian Alps

By TARTLTON RAYMENT, F.R.Z.S., Melbourne

Paracollotes stewarti sp. nov. (Fam. Colletidae)

TYPE: Male—Length, 9.5 mm. approx. Black. (Female, 12.5 mm.)

Head transverse, shining; face with long loose ochreous hair, which is black at sides (all black on some specimens); clypeus shining, with scattered large punctures and smoky hair; supraclypeal area rising to a fine carina; vertex with long black loose hair; compound eyes dark-claret, converging slightly below; genae with a few long white hairs; labrum and mandibulae black, the latter long and slender; antennae entirely black, submoniliform.

ALLOTYPE: Female—*Head* almost circular from the front: face with much long white plumose hair; on the vertex a few black hairs are intermixed; clypeus convex, coarsely punctured, the polished supraclypeal area rising to a fine carina; compound eyes converging below; antennae black, the flagellum obscurely brownish beneath; mandibulae polished black.

Prothorax black, with light-smoky hair; tubercles with a fringe of drab-white hair; *mesothorax* polished, with long loose black hair, with punctures of medium size round the margin, but an impunctate area in middle; scutellum similar, with a median sulcus; postscutellum dull, but with much black hair; metathorax with a scale-like sculpture over an area shaped like a Moorish arch; much long ochreous hair laterally; abdominal dorsal segments polished, with a silky obscure-purplish sheen, a few white hairs laterally, but much black hair apically [the female has a large apical red plate as in *Anthophora* (Rayment, 1942) females] ventral segments polished, pale margins, a few white hairs.

Legs entirely black, with white hair (much long black plumose hair on tibiae of female); tarsi dark-amber, with fulvous hair; claws reddish; hind coxal reddish-amber [conspicuously long-pectinate in female]; tegulae polished black; wings hyaline; nervures sepia; cells: the second cubital forming a trapezium, receiving the first recurrent nervure at its middle; pterostigma paler sepia and large; hamuli about eight, strong.

Locality—Mount Buffalo, Victoria, January 9, 1947.

TYPE and ALLOTYPE in the collection of the author.

Allies: *P. lei* Ckll., which has oblique striae on the enclosed area of the metathorax, and some red on the mandibles and flagellum, fifth tergite entirely greenish.

Note by collector (Mr. H. C. E. Stewart), to whom the new species is dedicated:

The first specimen of this species was obtained from a flower of the

Yam near Lake Catani, but unfortunately the insect's head was broken off and lost in the post; a series was collected near View Point, and one bee was captured not far from the Chalet.

A few days later more specimens were caught near the hut at the foot of the Hump, at approx. 5,000 feet altitude, by Miss E. Colline Chugg, who observed many females burrowing into the granitic soil. There was a number of holes, at which the bees maintained a busy traffic to and fro, while numbers of males hovered over the mound.

BEEs FROM THE VICTORIAN ALPS

By TARTLTON RAYMENT, F.R.Z.S., Melbourne

A collection of bees taken by Hugh C. E. Stewart, at Mount Buffalo, during the last week of December, 1946, and the first week in January, 1947, yielded more individuals and a few more species than he obtained on any of his previous visits to the highlands of the State. It would appear that the Victorian Alps are richer in APIDAE than has been hitherto expected. Systematic observation and collection should yield more surprises, for often the heavy falls of snow at that altitude persist for several months.

Several good series were also taken by a youthful member of the F.N.C.V. party, E. Colline Chugg, during the second week. This young naturalist of fifteen years is to be congratulated, not only on her zeal in collecting, but also on her careful mounting and neat labelling of the specimens, which simplified my study of them very considerably.

That the bees of Mount Buffalo (5,000-odd feet), in Victoria, should approach those of the island of Tasmania, 100-200 miles farther south, should occasion no surprise, for the altitude offsets the difference in latitude, so that the ecology is not dissimilar.

At the time of this visit, the flora was in all its glory. While alpine conditions are responsible for high specialization in the flora, yet the bees of the Mount are but little different from specimens taken along the lower areas of the littoral zone.

On the other hand, the honey-gatherers of the great arid centre of Australia are characteristic of that region, and it would appear that heat, as a factor in the evolution of bees, is of more importance than cold.

The forty or so specimens (including Miss Chugg's), among which is a new species, have been determined by me as follows:

Family HYLAEBIDAE

Hylaeus engimellus Ckll.

One female, larger than the type, and minus the light stripe on the prothorax and the cream-coloured hind tarsi.

On flowers of the Alpine Daisy, *Brachycome discolor*, var. *alpina*.

Euryglossa subsericea Ckll.

A robust female, indistinguishable from specimens collected at Como (New South Wales). Sandringham (Victoria) specimens have red tarsi, and the legulae are fulvous; the wing-nervures much paler.

Mackey's Lookout, Mount Buffalo, Vic., Jan. 10, 1947. E. Colline Chugg.

Family COLLETIDAE

Paracolletes irroratus F. Smith

Cockerell (1914) suggested that Fred. Smith (1853), at the British Museum, described this species under two names, the other being *Dasycolletes humerosus* 1879. Later, Cockerell (1914) described *P. humerosus cyanurus* from Oakleigh, Victoria.

A Mount Buffalo female is the large, more robust typical one of Smith's *P. humerosus*, the large shining convex clypeus having a few coarse punctures; the supraclypeal area polished; mandibles black.

The females of Cockerell's subspecies, *cyanurus*, seem to belong to a male from Emerald (in the Dandenong Hills, twenty miles farther east) and this may be known as the allotype. It has a more slender form, with much long white hair covering the face; closely punctured dull clypeus and supraclypeal area, and the straw-yellow "epaulettes" of the mesothorax. On the Buffalo specimens these are of a rich golden colour.

Females which I collected at Croydon, V., are typical except for the reddish mandibles. This locality is between Emerald and Oakleigh.

Mackey's Lookout, Mount Buffalo, Jan. 10, 1947. E. Colline Chugg.

Paracolletes obscurus F. Smith

One robust female, which I refer to this somewhat unsatisfactory species. There are slight bands of loose white hair on the abdomen.

Mackey's Lookout, Jan. 10, 1947. E. Colline Chugg.

Paracolletes leai Ckll.

A long series of males and two females, near to this species, which was described from Tasmania. Later, Professor Cockerell discussed a bee which was collected on King Island, roughly half-way between Victoria and Tasmania. It is a male, and he referred it provisionally to this species, although he thought that it might ultimately prove to be a closely related but distinct species.

The males now before me conform to his notes on the King Island insect, but the female is not a typical *leai*, and is not conspecific; therefore, a new name is advisable. I propose the name *Paracolletes stewarti*, and have given a specific description in the preceding article.

Paracolletes stewarti, sp. nov.

[For full description and discussion, see p. 102]

Paracolletes providellus Ckll.

Two females, typical and indistinguishable from specimens collected by me at Emerald, Victoria.

Mackey's Lookout, Jan. 10, 1947. E. Colline Chugg.

Heterocolletes capillatus Raym.

Three robust females, which cannot be distinguished from the allotype taken by me on the hills of Emerald, Victoria, in 1934.

These black shining bees are easily identified by the mass of long hairs which project from between the numerous facets of the compound eyes, a character found also in the hive-bee.

The genotype, a male, was taken by the late J. A. Kershaw, sometime Director of the National Museum, Melbourne, on Wilson's Promontory, Victoria, in 1929. Several hundred male insects were clustered together in a dry curled bracken frond, and I was able to verify this observation at Emerald. However, the trait is also characteristic of the males of *Paracolletes*.

The Buffalo record is the third of the species.

Mackey's Lookout, Mount Buffalo, Jan. 10, 1947. E. Colline Chugg.

Family HALICTIDAE

Halictus asperithorax Ckll.

A female, not quite typical, having entirely black legs, but otherwise indistinguishable from specimens taken at Sandringham.

Mackey's Lookout, Mount Buffalo, Vic., Jan. 10, 1947. E. Colline Chugg.

Halictus gilesi Ckll.

One black female, not quite typical, since the fine punctures of the scutellum tend to become microscopically rugose. It is, in any case, excessively close to *gilesi*.

On flowers of *Brachycome* sp.

Halictus humiliformis Ckll.

A series of robust females, not typical, for some have a bright royal-blue mesothorax, but the mesonotum in others is a dull dark-green, and there are intermediate links.

On flowers of *Brachycome* sp.

Halictus imitans Ckll.

One black female, not exactly typical, since it is a trifle larger, with the rugae of the metathoracic area coarser, and tending to anastomose.

On flowers of *Brachycome* sp.

Parasphecodes cirriferus Ckll.

One female, which seems to conform to Cockerell's description of the type.

Collected on the yellow flowers of the "Yam," *Microseris scapigera*.

Parasphecodes tilachus F. Smith

A series of females, all of which appear to conform to Smith's quite inadequate description. In the absence of his type specimens, accurate determination of this group is often impossible.

On the flowers of the "Yam," *Microseris scapigera*.

Parasphecodes wellingtoni Ckll.

A female conforming very well to the specific description, except that tergite No. 1 lacks the black patch. However, the species was described from Mount Wellington (alt. 1,300 to 2,300 ft.), Tasmania, but a subspecies, *P. wellingtoni griseipennis* Ckll., was taken at the Blue Mountains, New South Wales, on flowers of Golden Everlasting (*Helichrysum bracteatum*).

Parasphecodes melbournensis Ckll.

One female, quite typical, and indistinguishable from Emerald and Sandringham specimens.

Mackey's Lookout, Mount Buffalo, Vic., Jan. 10, 1947. E. Colline Chugg.

Family MEGACHILIDAE

Megachile chrysopyga F. Smith

A robust male, not quite typical, but antennae black (ferruginous beneath in *chrysopygopsis* Ckll.) and punctures of mesothorax not so close, with a delicate tessellation between, and more black hair: abdomen not so hairy. (*M. chrysopygopsis* has pale-straw to white hair on face; *chrysopyga* has deep-golden hair.)

Mackey's Lookout, Vic., Jan. 10, 1947. E. Colline Chugg.

Family CERATINIDAE

Exoneura montana Raym.

A fine large female, and I refer this specimen to *montana* because my recent studies of the larval forms of this genus show how inadvisable it is to propose new species in the absence of "nest" series with larvae. Described from Macpherson Range, N.S.W.

On flowers of the Trigger-plant (*Stylidium graminifolium*).

Exoneura robusta Ckll.

A fine robust female to which all of the foregoing remarks equally apply.

On flowers of the Trigger plant (*Stylidium graminifolium*).

Exoneura angophorae Ckll.

Three females, not quite typical, but in the absence of the larval forms, I refer them provisionally to this species.

Mackey's Lookout, Mount Buffalo, Vic., Jan. 10, 1947. E. Colline Chugg.

Additional field notes by Mr. H. C. E. Stewart:

Not only the new *Paracollletes*, but also *Exoneuræ*, were observed by me and other members of F.N.C.V. party to operate the curious mechanism of the Grass Trigger-plant (*Stylidium graminifolium*), which was in profuse flower everywhere.

Many of the bees were taken on *Compositæ* at Reed's Lookout, and especially in the alpine meadow along the streamlet on the View Point track, and later around the Lake. The specimens at Mackey's Lookout, 3,100 feet, were all collected by Miss E. Colline Chugg. The best collections were made in bright sunlight, during the morning hours. Generally, the bees showed little activity in the afternoon.

In the alpine altitudes, *Compositæ*, such as *Microseris*, *Brachycome*, *Helichrysum* and *Helipterum*, invariably close their inflorescences in the afternoon, and even in dull light; the ray-florets of *Microseris* close very tightly inwards, whilst those of *Brachycome* curl outwards. The bees favoured these two genera. *Compositæ* not so susceptible to fading light are *Celmisia*, *Podolepis* and *Lagenophora*, and these were less attractive to the bees.

Many flowers of the introduced Flatweed, *Hypochaeris radicata*, were fully open, but we did not see a single bee on these. The first favourite was the Yam, *Microseris scapigera*, the yellow flowers of which resemble those of Flatweed and the Common Dandelion. This partiality for the *Compositæ* was obviously due to the pollen, and the bright-yellow dust on bees taken from the Yam was particularly evident.

Richenia continentis, an epacrid, was visited occasionally by bees, and we rarely saw one visiting the Mountain Shaggy-pea (*Oxylobium alpestre*), the Derwent Speedwell (*Veronica Derwentia*), or other native flora.

Honey-bees were also noted on the densely-clustered flowers of two related eucalypts, *Eucalyptus pauciflora* and *E. niphophila*, both of which are rich in nectar.

Family APIIDÆ

Apis ligustica + *A. mellifera* L.

A series of workers of the introduced hive- or honey-bee (*A. ligustica* + *A. mellifera*), many showing only a trace of the former race, were taken by E. Colline Chugg and Hugh C. E. Stewart.

These records are interesting. Since no domesticated hive-bees are kept at the Government Chalet, then these cross-breeds must have come from wild colonies established in the Snow Gums, and are able to survive unaided the cold and snow of the long Alpine winter.

For the reed bees, *Exoneuræ*, in their frail shelters in reeds and rushes, the winter must indeed be a critical period.

REFERENCES

- Cockerell, T. D. A.—"A Small Collection of Bees from Tasmania," *Proc. Linn. Soc. N.S.W.*, Part 4, p. 598, 1912.
Cockerell, T. D. A.—*Ann. Mag. Nat. Hist.* (8), xiii, p. 140, 1914.
Rayment, Tarlton—"A Critical Revision of the *Zonata* Group in the Genus *Anthophora*," Japanese Edition *Troubin*, Part 1, p. 5, 1942.
Smith, Fred.—*Cot. Hym. B. M.*, 1, p. 40, also p. 12, 1853.
Smith, Fred.—*New Sp. Hym. B. M.*, v: II, 1879.

WHAT, WHERE AND WHEN Forthcoming Excursions, etc.

General Excursions:

- Saturday, September 6**—Blackburn Lake. Subject: "How to Collect Insects." Leader: Miss G. Chung. Train from Flinders Street 1.39 p.m. Fare, 1/3, 2nd class return.
- Sunday, September 7**—Eulombe Bay, Mornington. Subject: "Tertiary Fossils and Forshore Botany." Leaders: Messrs. A. M. Carter and A. J. Swaby. Bus leaves Batman Avenue 9.15 a.m. Bring two meals. Bus bookings, 5/6, with Mr. A. A. Baker, 33 Cattle Street, Preston.
- Saturday, September 13**—Cranbourne. Subject: "Orchids." Leader: Mr. J. Roy Garnet. Train from Flinders Street at 12.40 p.m. to Dandenong, thence bus to Cranbourne. Fares: Rail, 2/3½, 2nd class return to Dandenong; bus to Cranbourne extra.
- Thursday, September 25 (Show Day)**—Club Picnic to Ankie Gorge. Subject: "Birds and Botany." Leader: The President (Miss Ina Watson). Bus leaves Batman Avenue 8 a.m. sharp. Bring two meals. Note: Early bus bookings essential, 1/6, with Mr. H. Preston, 34 Coppin Grove, Hawthorn (Tel. Haw. 1853).
- Saturday, September 27**—Studley Park (Fairfield and). Subject: "Plant Ecology." Leader: Mr. J. H. Willis, B.Sc. Meet 5.30 p.m., Outer Circle bridge, connecting Fairfield and Kayr. (Take bus along Heidelberg Road.)
- Sunday, September 28**—Mount Dandenong. Spring Walk of approx. 7 miles. Leader: Mr. H. Preston. Train from Flinders Street, 9.25 a.m. to Croydon, thence bus to Mount Dandenong. Return train from Upper Ferntree Gully. Fares: 2nd class single to Croydon 1/4½; bus fare 1/8 single; 2nd class single rail from Upper Ferntree Gully 1/10—Total 4/8½.
- Saturday, October 4**—Croydon to Ringwood. Subject: "Special Local Botanical Features." Leader: Mr. T. S. Hart, M.A. Train from Flinders Street 10.10 a.m. to Croydon. Leader will meet 1.35 p.m. train from Flinders Street at East Ringwood for afternoon excursionists. All-day excursionists bring one meal.
- Saturday, October 4**—National Museum. Subject: "Oology—Old and New Methods of Study, and Introduction to Field Observations." Leader: Mr. F. G. Elford, B.Sc., B.Ed. Meet Russell Street entrance 2.30 p.m. Note: Second of series of lecture visits arranged with Director of Museum. Limit, 20 members, and names must be registered beforehand with Mr. H. Stewart (Tel. FU 022, extension 457).
- Saturday, October 11**—Upper Beaconsfield. Subject: "Haunts of the Wombat Honeyeater." Leader: Mr. A. S. Chalk, R.A.O.U. Travel by 7.40 a.m. train from Flinders Street to Beaconsfield. Fare: 3/3, 2nd class return. Return journey from Beaconsfield at 8.15 p.m. Bring two meals.
- Sunday, October 12**—Marston Gardens. Public Inspection. Leader: Mr. A. J. Swaby. Take Mont Albert tram in Collins Street and alight Parring Road. Turn left at top of Parring Road. Time: 2.30 p.m. (Members are requested to issue extensive invitations and to take part in a preliminary inspection on 4th, 5th or 11th at the same time.)

Special Fixtures:

- October 6-7**—Hawthorn Town Hall, Burwood Road, small hall. Hawthorn Junior Field Naturalists' Wild Life Exhibition. Further particulars from Mr. S. R. Mitchell and Mrs. J. J. Presme. Interest, and assistance, of all F.N.C.V. members extremely desired.
- October 14-15**—Ararat Wild Nature Show. It is proposed to stage exhibits from Melbourne. Arrangements for accommodation and dietetic trips for Melbourne members who can assist with Show. Particulars from Mr. Ivo C. Hammett.
- October 25-26**—Bendigo Week-end (by parlour coach). Limited party only. Further details from Leader, Mr. H. Stewart (Tel. FU 022, extension 457).

Group Fixtures:

- Saturday, September 20**—Botany Group. Ivanhoe. Subject: "Genus of Garden-grown Native Plants." Meet Ivanhoe Railway Station 2.30 p.m.
- Monday, September 22**—Botany Discussion Group. Royal Society's Hall, 8 p.m. Subject: "Genus of Victorian Plants," by Mr. J. H. Willis, B.Sc.
- Tuesday, October 7**—Geology Discussion Group. Royal Society's Hall, 8 p.m. Subject: "Radio-active Minerals," by Mr. P. S. Collier.
- Saturday, October 11**—Geology Group. University Geology School, University. Meet Geology School, 2.30 p.m.

A. A. BAKER,
Excursion Secretary.

The Victorian Naturalist

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OCTOBER 8, 1947

No. 766

PROCEEDINGS

The monthly meeting of the Club was held on September 8, 1947, the President (Miss Ina Watson) and about 180 members and friends attending.

The following were elected as Ordinary Members: Miss Maud Peterson, Mr. Allan Otto; and as Country Members: Mr. Gilbert F. Rogers and Mr. G. S. Campbell.

The evening was arranged as a Members' Night, with nature notes and remarks on exhibits, and the following are recorded for the meeting:

Mr. Paul Fisch: A series of six lantern slides showing granite outcrops and tors at Flinders Peak (You Yangs), sedimentary rocks at Walkerville (near Wilson's Promontory), puckering in rocks at Cape Liptrap, possible slumping structures at Keilor, and the Geological Group at work on a mapping excursion. Comments on the slides were made by Mr. Fisch.

Mr. Ivo C. Hammet showed a series of slides and commented on the display of *Eriostemon obovatus* at Mt. Arapiles. A $1\frac{1}{2}$ -acre block showed by actual count 138 large bushes, and the slides gave a good idea of the wealth of flowers in the area.

Mr. F. S. Colliver showed a series of slides illustrating some of the extinct Dinosaurs, and commented especially on the species found in Australia. Mr. Colliver also mentioned that members at the recent Mornington excursion were dismayed to see numbers of penguins covered with oil. It was reported to the meeting that action would be taken and the appropriate authority advised.

Mr. J. R. Garnet reported seeing a fan-tailed cuckoo on his back lawn recently taking a worm and hopping around, and behaving very much in the manner of a blackbird, which on first notice the bird was supposed to be.

Mr. G. N. Hyam reported that the Dept. of Agriculture had received a letter from a lady in Bulawayo stating she had seen a fine series of photographs of Australian wild flowers in the *Illustrated London News* of December last. Mr. Hyam recalled that the photographs were of exhibits from our last Show.

Mr. V. H. Miller referred to the wild flowers near the railway line near Cook, South Australia. These had sprung up after the recent rains and carpeted the ground white. At the 547/6-mile post on the same line he had noticed an eagle and one of the sparrow-hawks. Rabbits were very numerous in the area and it was suggested that the birds were following them up.

Miss Wigan noticed a flock of galahs flying over Toorak for the first time in three or four years.

Mr. C. J. Gabriel exhibited and commented on specimens of the *Teredo*, stating that Australia had six or seven species. Notes were given on the damage caused by these molluscs and on the means of controlling them.

Mrs. J. J. Freame exhibited some egg-cases that seemed similar but which actually belonged to a mollusc and a worm.

Mr. H. C. E. Stewart made some observations on the astonishing flexibility of the neck of the owl.

Mrs. J. Pinches spoke on an eagle's nest containing young and a half-eaten rabbit that was seen at Toolern Vale last week-end.

Mr. E. E. Lord exhibited and commented on magnificent specimens of *Eucalyptus caesia*, *E. macrocarpa*, *E. sepulchralis*, and also *Hakea cucullata*, garden-grown by Mr. Hateley, near Stawell. Comment was also made on the wide variation in colour of *Thryptomene* grown by Mr. Campbell at Hall's Gap. Colours were white, the usual pinkish-white, and deep pink.

EXHIBITS

Mr. A. N. Carter: Cowrie shells.

Mr. C. J. Gabriel: Victorian species of *Teredo*; growth stages in the Victorian cowry, *Cypraea angustata*; "bleeding tooth" shell from the Bahamas Islands.

Nat. Mus., Melb. Skin of *Apteryx owenii*, the little grey kiwi, and also the egg of a kiwi, possibly the same species.

Miss E. Raff: *Kennedyia rubicunda*, garden-grown.

Mr. L. Lowe: *Charisema cordatum*, garden-grown; also the following: Geraldton waxflower, *Thryptomene*, *Grevillea rosmarinifolia*, *Eriostemon obtusalis*, *Acacia spectabilis*, and *Grevillea linearis*.

Mr. H. C. E. Stewart: Spiders and insects collected on Blackburn Lake excursion, 6/9/47.

Mr. V. H. Miller: Botanical specimens from the Nullarbor Plain.

Mr. J. J. Freame: Ribbon fish from Portland; pteropods, shark's head, skeleton teeth, etc., "crucifix" fish, anemone from Altona; anemones from Mornington; stone fish from the Barrier Reef, etc.

Mr. J. Ros Garnet: 28 Victorian greenhood orchids; also re-articulated skulls of three species of snakes, namely, the copper-head (3 ft. 6 in., showing position of fangs), black tiger snake (5 ft., Reevesby Is., showing maximum rotation of fangs), death adder (1 ft. 11 in., showing maximum rotation of fangs).

WAYS OF CASSOWARIES

A member of the F.N.C. has asked these questions: (1) Does the male Cassowary "mother" its young in the same fashion as the male Emu and Kiwi? (2) Is it known if the Cassowary drums? Both questions are to be answered in the affirmative. It has been established from observations made in Zous that male Cassowaries adopt family obligations in the same manner as other Ratite birds; and through the same facilities it has been ascertained that Cassowaries make a drumming noise—one writer describes it as "a hissing drumming." Although based on island species, these observations would apply also to the Australian Cassowary.—A.H.C.

THE GENUS *DIURIS* IN WESTERN AUSTRALIA

By W. H. NICHOLLS, Melbourne

That *Diuris* is essentially an Australian orchid genus is apparent by its distribution. Approximately 38 distinct species are recorded, and all of these, with but a single exception, are found in the Australian States. (The exception is the endemic Javanese species, *D. Fryana* Ridl.,¹ which was described in 1885). Queensland lists 9 species, New South Wales 29, Victoria 9, South Australia 8, Tasmania 5, and Western Australia 7.

In this paper, only the western species will be dealt with. These (with the exception of *D. longifolia*, a variable species in some respects) are endemic to Western Australia.

During a recent and somewhat prolonged visit to the fertile areas of the south-western part of the State in the months of September, October and November, the present writer came across all of the western representatives of *Diuris*. The majority of these were found in abundance (for several are gregarious forms) either on the extensive clay-pans and other moist places or on open, rather wide sandy spaces. Thus a complete review of the various species, including some varietal forms, listed for Western Australia was made possible.

Useful work on the Western Australian *Orchidaceæ* (embracing the genus *Diuris*) had been done previously by Mr. Oswald H. Sargent,² Dr. R. S. Rogers³ and Mr. Alex. Purdie.⁴ Unfortunately no worker had published a survey of *Diuris* in the West. The published results (chiefly notes) of the above-mentioned workers, however, have been of material use to the present writer.

Study of the genus *Diuris* does not present such great difficulties as are apparent in some other genera of Australia orchids as, for example, such unstable genera as *Prasophyllum* and (to a lesser degree) *Thelymitra*. Nevertheless a thorough study of the characteristics of *Diuris* is facilitated by the examination of perfectly fresh material, combined with careful and close observation in the field.

Individual specimens of most orchid species vary from the type form, chiefly in respect to height of the specimens, size of the flower and colour-markings; such is only to be expected. But the worker in the field occasionally meets with extremes—well-marked instances of differentiation, such as the present writer witnessed in Western Australia. Such cases are, I consider, worthy of record.

Consider *Diuris emarginata*. Several amazingly congested colonies of this tall-growing species exhibited unusual degrees of height, stature and size of flowers. All the specimens in the groups or colonies seen were in bloom, the individual plants ranging in height from about 6 inches to over 3 feet. All were growing under the same conditions of soil (black peat) and light. Many plants

were probably young seedlings flowering for the first time. The congested mass of tubers in the over-burdened soil would in a brief space of time surely create conditions which would eventually force a survival of the fittest.

Hybridism appeared to be present in some massed displays of *Diuris carinata*. Some flowers were almost wholly yellow, others (the great majority) at the other extreme—bold red-brown, or purple-brown, dominated the whole flower. Intermediates were apparent, but in lesser numbers. The flowers of these groups varied much in their size. But the varying size of the flowers and the diverse colour-forms were quite satisfactorily disposed of when the gynandrium was examined—every flower possessed the very characteristic mauve-blotched column, the hall-mark of a true *D. carinata*.

All the Western *Diuris* species are adaptable to cross-pollination.

1. *Diuris laevis* FitzG. (*Gard. Chron.*, XVII (1882), 495).

A slender plant 20-35 cm. in height. Leaves 3-7, narrow, linear, spirally-twisted, 8-10 cm. long, enclosed at their base by a prominent sheath. Stem-bracts 1-2, linear-lanceolate, the lower one similar to the leaves; floral-bracts loosely-sheathing. Flowers 1-5, pale yellow, with brown blotchings on the underside of dorsal sepal, petals and labellum. Dorsal sepal small, almost triangular or narrow-lanceolate, embracing the column, and about half the length of the other segments. Lateral sepals narrow-linear, parallel, stipitate, about 1.3 cm. long (overall). Labellum 3-lobed, about same length as the petals, the lateral lobes half the length of the middle lobe, somewhat falcate and fringed or denticulate along the upper edges; middle lobe ovate-rhomboid or triangular; disk with 2 raised smooth plates, which extend to about $\frac{1}{3}$ or $\frac{1}{2}$ the distance along the mid-lobe, then continue as a single raised ridge to the apex. Column wings broad, toothed, and about as high or a little higher than the anther.

Flowering: September, October.

Habitats: Upper King River and Mt. Barker districts (W.H.N.). A prolific species in the above localities.

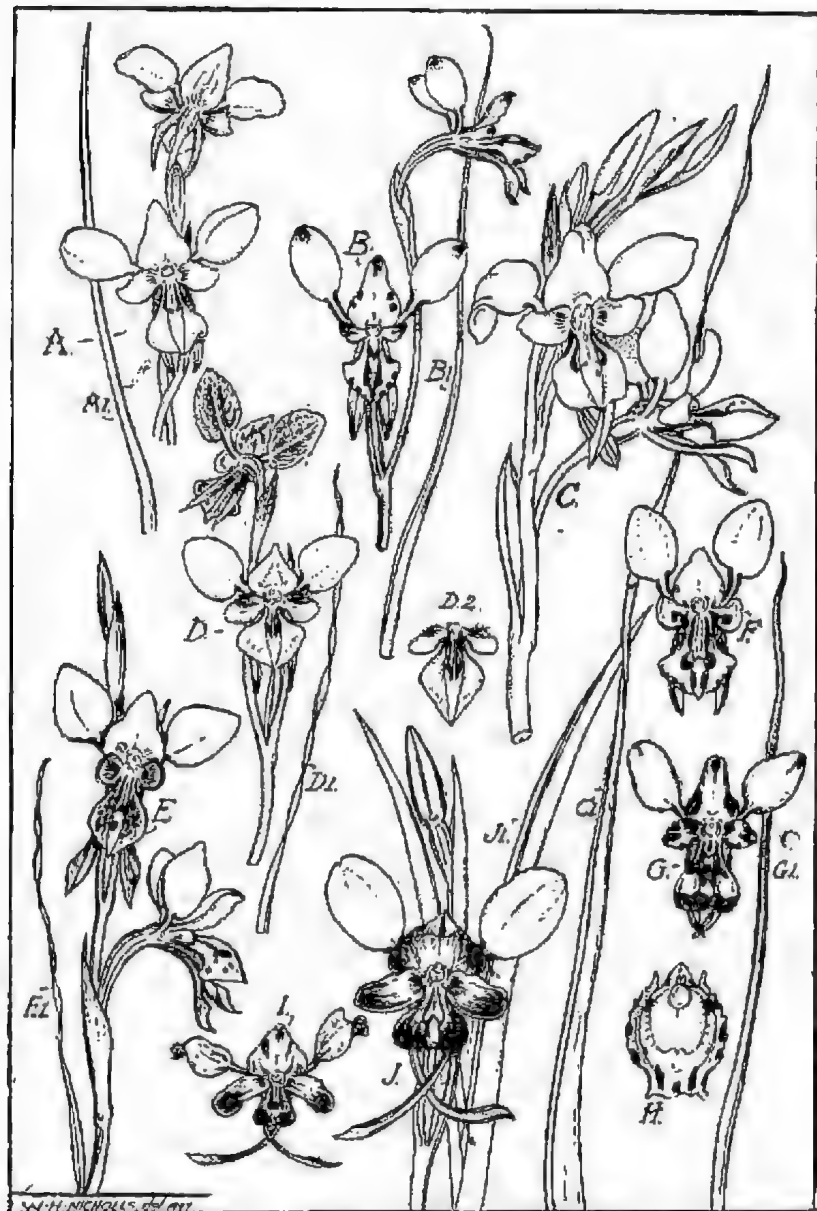
Figured by Alex. Purdie (*Muell. Bot. Lact.*, Sept., 1900) under *D. pedunculata* R.Br. (fig. 32), and referred to by Oswald Sargent (under *D. setacea* R.Br.) in *Systematic Notes on Orchidaceae* (1907), p. 82 (See also R. D. FitzGerald's beautiful plate of *D. laevis* (in *Australian Orchids*, Vol. 2, Pt. 3), which shows the characteristics of this species well.)

2. *Diuris Purdiei* Diels (*Journ. and Proc. Muell. Bot. Soc.*, April, 1903).

A slender or moderately robust plant 12-45 cm. in height. Leaves 5-10, narrow linear, filiform on a wide base, spirally-twisted, about 8-10 cm. long. Stem-bracts as in *D. laevis*. Flowers 1-5, pale yellow with red-brown wall-flower markings, chiefly on the labellum and lateral sepals. Dorsal sepal about 1.5 cm. long, broad, ovate-triangular. Lateral sepals stout, linear-lanceolate, about 1 cm. longer than the labellum. Lateral petals golden yellow above, wall-flower on the reverse, orbicular or elliptical, on a claw $\frac{1}{2}$ the length of the labellum. Labellum with two short raised lines situated widely apart at the base of the lamina (the lines somewhat rugose), and extending as a single ridge to the apex. Middle lobe very wide, almost rhomboid, and more than twice as long as the half-ovate lateral lobes; lateral lobes deeply cleft on the outer margin and toothed along the upper, the margins red-lined. Column appendages narrow, almost as high as the anther.

Flowering: October, November.

Habitats: Middleton's Beach (hill-slopes), Eusselton, Upper King River (W.H.N.).



For Key, see page 116.

The red-margined lateral lobes of the labellum give the flowers of this species a bespectacled appearance.

This *Diuris* generally dries a purplish colour. In the Busselton district the species attained a height of 45 cm. and over, with 3-5 flowers; elsewhere it was of low stature, with 1-3 blooms.

3. *Diuris setacea* R.Br. (*Prod.*, 1810, 316).

A slender plant about 20-35 cm. high. Leaves 7-8, linear, filiform, setaceous, about 8-10 cm. long, enclosed at their base by a prominent sheath. Stem-bracts 2-3, linear-lanceolate, the lower one similar to the leaves; floral-bracts subulate, loosely-sheathing. Flowers 1-3, yellow with few reddish markings. Dorsal sepal narrow-lanceolate, triangular; lateral sepals broad-linear, parallel, green and red-brown, about 4 mm. longer than the labellum. Petals ovate, stipitate, about 1.3-1.5 cm. (overall). Labellum 3-lobed, about as long as the petals, the lateral lobes ovate; anterior margin and base marked with red-brown; middle lobe ovate-rhomboid, margined with red along the posterior margins, disk with 2 raised plates extending to about half the length of the mid-lobe, then continuing as a single broad, raised ridge to the end, apex rounded. Column wings usually narrow, sometimes rather wide, toothed along the outer margins, shorter than the anther.

Flowering: September, October, November.

Habitats: Upper King River and Upper Kalgan areas (W.H.N.) Abundantly distributed over dry clay flats in lightly timbered areas.

Oswald H. Sargent² describes the leaves of *D. setacea* as "spirally-twisted." In my material the leaves were *sulcateous*, as described by Brown in his *Prodrangis* (see author's footnote).

4. *D. carinata* Lindl. (*Gen. et Sp. Orch.*, 1830, 510)

A slender, sometimes very slender plant from about 18 cm. to over 45 cm. high. Leaves 2-3, narrow-linear or filiform, about 3-16 cm. long. Stem-bracts 2-3, the lowest similar to the leaves, those within the raceme smaller. Flowers 1-4, variable in size, pale yellow with few markings, or bright yellow with red-brown or purplish-brown markings dominating. Dorsal sepal ovate, oblong or ovate-cuneate, about as long as the labellum. Lateral sepals linear, usually parallel, occasionally crossed. Petals oval, stipitate, spreading, reflexed, the claws often stout, as long as or a little longer than the lateral sepals. Labellum 3-lobed from a little above the base, the lateral lobes often broad, but variable as to size, more commonly about half as long as the middle lobe. Middle lobe rather broad, sometimes the margins rolled back, semi-circular (hatchet-shaped); the base contracted, the plate along the centre much raised and deeply furrowed, forming on the claw of the middle lobe a double keel merging into a single one on the broad lamina. Lateral lobes of the column narrow, often much blushed and otherwise marked with purple, as high or a little higher than the anther.

Flowering: September, October, November.

A very abundant species on clay-pans and other damp areas. Habitats: Perth and surroundings districts (W.H.N.), Busselton (W.H.N.), Yarroop and surroundings (W.H.N.).

D. filifolia Lindl. is synonymous with this species. R. D. FitzGerald, in *Australian Orchids* (an unpublished plate), 1894, figured *D. carinata* under *D. emarginata*.

5. *Diuris emarginata* R.Br. (*Prod.*, 1810, 316).

Often a tall, somewhat stout plant from about 25 to 90 cm. high. Leaves 2-3, narrow-linear, wider towards the base and there channelled, semi-spiral towards the end, 15-30 cm. long. Stem-bracts 3-4, loosely sheathing, varying much in length, the longest often 20 cm. long; other bracts 2.5-5 cm. long. Flowers up to 7 (in my specimens), yellow with red-brown markings towards the base of the labellum (chiefly); distant in a loose raceme. Pedicels slender,

erect; lateral sepals 2.5 cm. long; petals a little shorter, elliptical, contracted on a short claw; dorsal sepal shorter than the petals, on a firm base and embracing the column, open at the top; labellum as long as the dorsal sepal, the lateral lobes broad, triangular, entire or toothed, from $\frac{1}{2}$ to $\frac{2}{3}$ as long as the middle lobe, and the double raised keel merging into a single one on the lamina of the middle lobe. Column wings as high as the anther. Tubers long and narrow.

Flowering: September to December. Synonyms *D. Drummondii* Lindl., Swan Riv. App., 51; *Gen. et Sp. Orch.*, 510; *D. laxiflora* Lindl., Swan River App., 51; *Gen. et Sp. Orch.*, 510.

Habitats: Bayswater, Busselton (Mr and Mrs. W. H. Nicholls), Yarloop (Mrs. E. Scouler).

This species, the largest of western *Diuris*, favours moist, often shady, places, and sometimes grows abundantly and luxuriantly with its "feet" in water.

6. *Diuris longifolia* R.Br. (*Prod.*, 1810, 316).

Often a stout plant 10-45 cm. high. Leaves 2-3 linear or lanceolate, acute, channelled, usually one longer than the other. Flowers sometimes solitary, but normally 4 or 5, in a loose raceme. Yellow or yellow and brown, the colours suffusing into each other as in the wall-flower, or with the labellum mauve, which typifies the larger western form. Dorsal sepal very broad and rounded, about 10 mm long; lateral sepals green, linear, with oblique points, parallel or crossed, 18-19 mm. long. Petals stipitate, recurved or spreading; the lamina oval or elliptical, overall length about 20 mm. Labellum about 10 mm. long, mauve or dark brown and yellow blended; the lateral lobes prominent, almost as long as or longer than the middle lobe, obconate, the margins entire; middle lobe rounded and retuse anteriorly; lamina with a single (occasionally double) ridge at its base and continuing as a single keel to the tip. Lateral wings linear-falcate with irregular margins.

Flowering: September, October.

Habitats: Darling Range, Perth and surrounding districts, Upper King River and Albany, Yarloop, etc. (W.H.N.).

Syn.: *D. porrifolia* Lindl. *D. corymbosa* Lindl.

Variety *PARVIFLORA* (var. nov.). *Floras parvi*. A small-flowered, rather striking form prevalent in the Lesmurdie area at the Darling Range (September, 1946).

7. *Diuris pauciflora* R.Br. (*Prod.*, 1810, 316).

A slender, often attenuated plant from about 15 to over 40 cm. high. Leaves very narrow, usually 3, 8-15 cm. long. Flowers 1-4, yellow, spotted and otherwise marked with brown or purplish-brown. Petals ovate, about 1.1-1.5 cm. long (overall), the claw short; lateral sepals linear but rather wider than in most species, about 1.5 cm. long. Dorsal sepal shorter than the lateral sepals, dotted on the margins and at apex. Labellum as long as or longer than the dorsal sepal 3-lobed from above the base, the lateral lobes less than half the length of the middle lobe, with a single raised ridge along the center. Anther higher than the viscid disk of rostellum. Lateral wings of column a little shorter than the anther, oblong-lanceolate, incurved, the lower margins yellow, sinuous, stigma prominent.

Flowering: September, October, November.

Habitat: Yarloop (Mrs. E. Scouler; W.H.N.).

Notes: In the foregoing descriptions I have given only those habitats where my material was obtained.

The determination of the various species has been based on a careful reading of the original descriptions (in Latin) by (chiefly) Robert Brown,⁵ also Bentham,⁶ who had access to the type specimens; and, in one or two instances, on Dr. R. S. Rogers' own conclusions.⁸

With all due respect to the conclusions of Oswald H. Sargent, I must mention here that his brief descriptive notes on *D. setacea* and *D. carinata* are at variance with the original descriptions of Brown and Lindley.⁷ He writes, however: "I have, on two different occasions, sent specimens of both species to the British Museum, where they have been compared with authentic specimens, so there can be no doubt about the determinations." (Bentham united *D. carinata* Lindl. with *D. setacea* R.Br., but both are very distinct species.) The above statement is rather puzzling in view of Robert Brown's own descriptions—chiefly that of *D. setacea* (W.H.N.).

BRIEF ANALYSIS OF SPECIES

Flowers yellow, the undersurface of segments marbled light brown; lateral lobes of labellum with fringed or denticulate upper margins; leaves 3-7, narrow linear, spirally-twisted—*D. laevis*.

Flowers yellow, with wall-flower markings; lateral lobes of labellum margined with red and deeply cleft on outer margin; lateral sepals stout; leaves 5-10, narrow linear, spirally-twisted—*D. Purdiei*.

Flowers yellow, with inconspicuous red-brown markings; labellum with a conspicuous double keel merging into a prominent single keel; leaves 7-8, setaceous—*D. setacea*.

Flowers often very small, yellow, or yellow with bold brown or purplish markings; column marked with dark blotches; labellum mid-lobc prominently keeled; leaves 2-3, narrow linear or filiform—*D. carinata*.

Flowers yellow, rather large in a loose raceme; leaves 2-3, long, imperfectly spiral; plant tall—*D. emarginata*.

Flowers yellow with wall-flower shades, dorsal sepal broad, the labellum often mauve; lateral lobes of labellum longer than the mid-lobc; leaves 2-3, broad-linear, channelled—*D. longifolia*.

Flowers few, yellow with few brown blotches along the margins; lateral sepals wide, rather prominent; labellum with a single ridge along the centre; column wings sinuous at the base—*D. pauciflora*.

REFERENCES

1. *Forbes' Nat. Wand. E. Ind. Arch.* (1885).
2. *Systematic Notes on Orchidaceae*, read before the Society (W. Aust. Nat. Hist. (?) , Nov., 1907, p. 10).
3. *Trans. Roy. Soc. S. Austr.* xlv (1920).
4. *Muell. Bot. Soc. Lecture* (Sept., 1900).
5. *Fl. Austr'alis*, vi (1873).
6. *Prodr. Fl. Nov. Holl.* (1810).
7. *Gen. et Sp. Orch.* (1830).

KEY TO ILLUSTRATION ON PAGE 113

(Western Australian species of *Diuris* Sm.)

Figures: A—two flowers of *D. setacea* R.Br.; A1—a single leaf of *D. setacea* R.Br.; B—two flowers of *D. pauciflora* R.Br.; B1—a single leaf of *D. pauciflora* R.Br.; C—raceme of bloom *D. emarginata* R.Br.; C1—a single leaf of *D. emarginata* R.Br.; D—two flowers of *D. laevis* FitzG.; D1—a single leaf of *D. laevis* FitzG.; D2—labellum (acute form) of *D. laevis* FitzG.; E—flowers of *D. Purdiei* Diels.; E1—a single leaf of *D. Purdiei* Diels.; F—flower of *D. carinata* Lindl.; light yellow form; often this form is diminutive; G—flower of *D. carinata* Lindl. (common form around Perth districts); G1—a single leaf of *D. carinata* Lindl.; H—typical column of *D. carinata* Lindl.; I—flower of *D. longifolia* R.Br., var. *purviflora*, var. nov.; J—flower of *D. longifolia* R.Br., western form; J1—leaves (2) of *D. longifolia* R.Br.

PLATE IX



King Orchid (*Dendrobium speciosum*): a fine garden specimen which has carried as many as 41 sprays.

Photo. by Hilda Curtis.



Orange-blossom Orchid (*Sarcochilus falcatus*).

Photo. by A. H. Chisholm.

THE EPIPHYTIC ORCHIDS OF VICTORIA AND
TASMANIA

By the REV. H. M. R. RUPP, Northbridge, N.S.W.

Some of your orchid-loving readers may like to know a little more about the five epiphytic orchids now recorded in Victoria, beyond the bare facts of their occurrence and the technical descriptions of their features. Two of the five extend across Bass Straits to Tasmania. (Have they ever been looked for on any of the intervening islands?) All five are found in New South Wales; three certainly, and just possibly four, are also Queensland plants.

It is worth noting that only one of the five species concerned—*Sarcochilus australis*—occurs in Victoria west of the county of Croajingalong. Years ago this little "Gem of the Bush" used to be quite common at Upper Ferntree Gully; I hope it still is! I remember searching for it in vain in the beech forests of the Otway Ranges; apparently it has been unable to cross the gap of open country between that area and the Dandenongs. It is found in the north-eastern portion of Tasmania, but so far as I know, it does not extend farther west in that State than in Victoria. It occurs in New South Wales, and has been recorded as a Queensland plant; but I am very doubtful whether this record can be confirmed. F. M. Bailey admitted it into his *Queensland Flora*, Vol. V, p. 1553, but he merely says of its habitat, "In southern localities, rare." No Queensland specimens are known.

My own view is that in all probability the Queensland record is based on specimens of *S. spathulatus* Rogers, a plant of similar habit and appearance which was described as late as 1927. I doubt very much whether *S. australis* extends much farther north than the Gosford district of New South Wales. It is not uncommon in gullies between Port Jackson and the Hawkesbury River; and Fitzgerald records it for the Blue Mountains, where I have looked for it in vain. Though small, it is a lovely little fairy of the orchid world, with its dainty racemes of multi-coloured, fragrant flowers. It is an extremely difficult subject for cultivation; even Fitzgerald, in his wonderful Hunter's Hill orchid garden, was unable to keep it for any length of time.

The other species of *Sarcochilus* found in Victoria, *S. falcatus*, seems to have its chief home there on the Cann River. It does not extend to Tasmania, but its range of habitat is more extensive than that of *S. australis*. My own most northerly specimen came from Millaa Millaa, on the Atherton tableland in North Queensland, nearly 1500 miles from the Cann River. The snowy, fragrant flowers of this beautiful little orchid have earned for it the popular name of Orange-blossom Orchid. A splendid full-page photograph of the typical form will be found on p. 4 of the *Australian Orchid Review* for September, 1936. It exhibits, however, considerable variations from the type. In some forms the flowers are

blotched with purple or other shades. Fitzgerald described one (a consistently small plant with the labellum blotched with bright purple) as a distinct species, which he named *S. montanus*. But there are so many intermediates, that this specific distinction cannot be upheld. The Millaa Millaa form is also a very small plant, but the flowers are larger than any others I have seen and are richly coloured with reddish-purple and orange on the white background. A large plant found in the foothills of Barrington Tops in New South Wales had cream flowers with a tuberoso perfume. An early-flowering form, not far away had flowers similar to those of Fitzgerald's *montanus*, but with a most repellent odour. The species is common in southern Queensland, and in many New South Wales forests between the main Dividing Range and the coast; it is also abundant in the Blue Mountains about Mount Wilson. It is more amenable to cultivation than *S. australis*.

Dendrobium speciosum. Notwithstanding the laudable effort in Victoria to substitute the name King Orchid for the absurd older vernacular "Rock Lily," I am afraid popular custom stubbornly refuses to abandon the latter over the greater portion of the extensive habitat of this truly regal orchid, which just crosses the Victorian border in eastern Croajingalong. Its range is even greater than that of the Orange-blossom Orchid; for it occurs north of the Atherton tableland, and has been reliably reported in a few New South Wales localities on the western side of the Dividing Range. It is one of the largest plants among Australian orchids, being rivalled in bulk only by one or two species of *Cymbidium*, and in North Queensland perhaps occasionally by *D. undulatum*. I have seen plants that would, I am sure, have required three men to carry them. The most magnificent display of this species ever witnessed by me was on the Clarence River near Copmanhurst, in northern New South Wales. A huge block of sandstone, its surface measuring about 30 ft. x 20 ft., had broken from a cliff, probably centuries ago, and lay prostrate on the slope below. The whole surface, and a good deal of the sides, was literally covered with large King Orchid plants, all in bloom. I calculated that there must have been well over 500 racemes. Each raceme would have not less than 40 flowers (some would have far more), so that a conservative estimate would give the number of individual flowers as upwards of 20,000.

The King Orchid is very variable, and botanists have not been very successful in defining varieties, most of which seem to be more or less inconstant. Var. *Hilli*, with tall, relatively slender stems and smaller but more numerous flowers, is fairly easily recognized. It is the dominant form in the southern half of Queensland. The species is equally at home on rocks or trees. On the banks of the Allyn River in the foothills of Barrington Tops, the river-oaks (*Cusuarina Cunninghamiana*) are laden with great clumps of this orchid. As the trees do not appear to be in the least

affected by their encumbrances, we may take this as a practical demonstration of the fallacy of designating orchids as "parasites."

The humble, distant cousin of the King Orchid, *Dendrobium striolatum*, is admirably illustrated in a photograph by Mr. H. T. Reeves in this journal for January, 1938, facing p. 141. It grows exclusively upon rocks. It extends to the east coast of Tasmania, but is not abundant there. Its northern limit seems to lie a little to the north of Newcastle in New South Wales. It is plentiful in some parts of the Blue Mountains, and I have seen it on the Upper Lane Cove River near Sydney. Although less attractive than some of the other members of the terete-leaved section of *Dendrobium*, Mr. Reeves has shown that in a congenial environment it can make a very charming picture.

The fifth Victorian epiphyte is that dainty little sprite of the air, the so-called Tangle Orchid (*Sarcanthus tridentatus*). It is the latest-recorded of the group, and was described and illustrated in this journal for April, 1936, by Messrs. F. E. Prescott and W. H. Nicholls. The popular name is based on the great development of tangled aerial roots in the adult plant, which sometimes hangs from its host by a single root-strand. The flowers are very small and insignificant, but possess a delightful fragrance. The species has a range of habitat agreeing with that of the Orange-blossom Orchid. It was formerly known as *Cleisostoma tridentatum*, under which name it appears in the article cited above; but as the genus *Cleisostoma* is now regarded as obsolete, it was transferred to *Sarcanthus* in 1941. It flourishes most vigorously in moist gullies where there is permanent water, and is not easily cultivated except under humid conditions.

MEMORIALS TO ABORIGINES

To the Editor.

Sir,—There is a paucity of national memorials in Victoria to honour its original inhabitants. Fortunately, one such has been erected to Barak at Healesville.

Since they will be of educational value and a directive to the unique Stone Age men which originally inhabited the State, it is suggested more should be erected to their memory in suitable areas. A good area is the You Yang range. When the unveiling of a tablet to Matthew Flinders took place on 19/4/1912 on Flinders Peak it was attended by Billie Leigh, a rather good-looking, full-blooded, well-dressed aboriginal, the last of the You Yang tribe. His photograph appeared in the *Weekly Times* of 27/4/1912.

May I suggest that a memorial be erected on the You Yangs to Billie Leigh and his tribe?

The Club has previously taken a leading part in the formation of National Memorials. This should be a worthy one.

Yours, etc.,

ARTHUR H. E. MATTINGLEY,

NIGHT SINGING OF BUDGERIGARS

By EDITH COLEMAN, Blackburn, Victoria

The Editor's interesting footnote (*V.N.*, Sept., p. 97) on Shakespeare's parrot, clamorous "against" rain, recalled the antics of a galah which we had for some 15 years. He was free in the day-time but his cage door was left open and he put himself to bed. Should rain fall before his cage was brought in he danced up and down, with widespread wings, calling noisily. We did not know whether he clamored "against" the rain or for delight in it.

That caged parrots were becoming well-known in Shakespeare's day may be gathered from his references to parrot talk. Benedict calls Beatrice a "parrot teacher." "Drunk? and speak parrot" (*Othello*) recalls John Maplet's advice on the teaching of parrots: "Give them wine and they will be wanton enough. They are hard on the head as on the beak. When they learn to speak they must be beaten with an iron rod or they feel it not" (modernized spelling—E.C.).

Shakespeare would probably have read Maplet's *Natural History* (1567), believed to be the first book in the English language in which the term "natural history" is known to occur. He would no doubt have seen William Turner's book on birds (1544) published in Latin. Turner was the first Englishman "to produce a treatise in anything like a modern scientific spirit." The edition of A. H. Evans (*Turner on Birds*, 1903) should have a note on the poet's clamorous parrot. I have not access to this.*

Turning to a few authors at hand it has been interesting to find that many birds are clamorous just before rain, and so are regarded as weather prophets. Sparrows, magpies and ravens chatter before rain. Geese and peacocks scream. The green woodpecker is called rain-bird for the same reason, and the golden plover, whose names in Latin and French (*Pluvialis* and *Pluvier*) refer to its weather prognostications, is a well-known "rain-bird."

According to Theophrastus, it is a sign of rain when a raven, who makes many sounds, repeats one of them quickly, or if he imitate falling raindrops; or if a heron utter his note at early morning, or a chaffinch utter his at dawn (Hort's translation).

I am afraid most of us have attached too little weight to the weather sense of birds. (Kipling's seal, Padda, was sent down to the beach to sniff to-morrow's weather forecast!)

The instances cited do not explain the night singing of budgerigars, for they sometimes sang when no rain followed. On June 24 our budgerigars sang again from 8.45 p.m. until 9.20 p.m. It was a windy night. There was no rain, and no moon, but it did rain later on in the night.

*Actually *Turner on Birds* has little to say about parrots and nothing regarding their "clamour."—Editor.

July 10: They started at 10 to 9 and sang for 20 minutes in gentle rain.

July 14. High winds all day. Birds began singing at $\frac{7}{8}$ to 9. Rain just spitting.

August 22: We drove 80 of them to a large aviary. They prattled all the way, although packed in six small cages, little larger than kerosene boxes. Was it vibration, or noise of the engine?

It is interesting to note that budgerigars are vocal all through the winter. Their musical prattle seems never to cease except when they sleep.

With reference to early and late broods, on August 22 we saw many young in the aviaries of a fellow-enthusiast. As some of them had left the nests they would be five or six weeks old. Others were fully-fledged and almost ready to leave.

ERRATA, V.N., SEPT., 1947

Page 100, last line: for "lemurs" read "lemmings." Page 101, 2nd and 3rd pars.: for "mild-green" read "wild green."

EXCURSION TO BALCOMBE BAY

On Sunday, September 7, some 50 members and friends attended the excursion to Balcombe Bay, near Mornington. After lunch, the geology and botany of the area were studied by separate parties. The features seen by the geologists are here described.

From the cliff above Marina Cove a fine view of Balcombe Bay was obtained, and the leader described the physiography of the eastern coast of Port Phillip Bay, with the granitic masses of Arthur's Seat, Mt. Martha and Mt. Eliza marking the line of the eastern edge of Selwyn's Fault.

The excursionists walked south along the cliff-top, here and there obtaining views of the bay, and of Fossil Beach. While descending the track to the beach through the luxuriant foreshore vegetation, the attention of the party was called to the unusual "blind gully" formations caused by two major and several minor landslips when large portions of the original cliff moved seawards on the wet, slippery surface of the Balcombian clay, a feature of these clays which excursionists later discovered for themselves.

In the afternoon the party visited the coast a quarter of a mile to the south of the Cement Works. On the way they were shown the line along which a fault had sheared off the grey clays and substituted basalt as the surface rock. This basalt belongs to the Lower Tertiary "Older Basalt" series, and was seen to be of a columnar structure, differential weathering making the joints between the columns very clear at the surface. The lignite deposit was also visited, and specimens were collected from it.

The remaining hours of the excursion were spent securing fossil shells from the grey Balcombian (Middle Miocene) clays. Many interesting shells were found, the most notable being *Solastojanus carinatus*, a rare species of *Typhiz*, and one of the larger cowries, *Umbilicaria erimta maccayi*.—A. N. CARTER, Geology leader.

PHOTOGRAPHIC EXHIBITION

About 250 coloured photographs of flowers and plants, mainly Victorian and Western Australian, are to be shown by Messrs. H. T. Reeves and W. H. Nicholls in the Kodak Gallery (basement) for several weeks from October 6. The opening ceremony will be performed by the President of the F.N.C. (Miss Watson) on October 6 at 3 p.m. All members of the F.N.C. should make a point of attending this exhibition.

A REMARKABLE BUDGERIGAR

By A. F. D'OMBRAIN, Newcastle, N.S.W.

We know that some budgerigars become quite good talkers, but I have one that makes a specialty of imitating wild birds. The strange thing about this chap is that, with one exception, he has picked up all the notes himself, without encouragement.

He is a sky-blue bird, in his fourth year. His repertoire is made up of the voices of fifteen different birds which I am quite sure of, and there are others which may be included. An ironical factor is that he copies the call of the lyre-bird to perfection. He picked this up at the Barrington-Tops Guest House, which is situated at the foot of the dense gullies which make up that great range.

Whenever I go away for the week-end I always take my bird, as I do not like leaving him, with the possibility of some friend forgetting to feed him. That is how he acquires his bird-calls. He is quite at home in a car and has travelled as far south as Huskisson and as far north as Barrington, while short trips are legion, so he has had the chance of hearing quite a lot of birds.

The only call I taught him is the whistling call of my father's great palin cockatoo, but, of course, the mimicry is merely a miniature of the voice of the large bird.

The list of birds imitated is as follows, with the best six given first: Grey thrush, lyre-bird, black-faced flycatcher, whistling eagle, whip-bird, wagtail, restless flycatcher, golden whistler, bronze cuckoo, silvereye, blue wren, pallid cuckoo, yellow robin, sparrow, starling.

"Budgie" is in a cage but is allowed out every evening in the house, a procedure he enjoys immensely. After a few short flights in the room, he sits on my finger and goes through all the quaint little antics common to these birds. He talks fairly well and has a vocabulary of over 130 words. When he gets in the mood for bird-calls he rattles them off one after the other, with a lot of notes of his own manufacture as well.

He also talks in his sleep—at least, that is how it appears to me. His head will be well tucked into his back feathers, and he will be rocking gently on his perch, when, suddenly, muffled squeaks come from his back, and one hears several of his bird-calls and quite a number of his words. He appears to be like a dog that is dreaming in front of a fire—he shakes quite visibly as the talking goes on.

Of his calls, the thrush and the lyre-bird I consider the best, although the whip-bird is at times nearly perfect. At Barrington a thrush would often perch on his cage, so it is not surprising that he copied the call. The wagtail's voice he acquired from one that runs about on the lawn near his cage. At times I cannot tell which is the budgerigar and which is the wagtail. The way he can mimic the sounds of a party of sparrows fighting is astounding.

To illustrate how alert birds must be, this one copies exactly the squeak of a gate nearby and also the squeak of a wheelbarrow. Moreover, during the football season last year he would imitate the sound of the referee's whistle, coming from the park about half a mile away. For another achievement, he has picked up the call-sign of one of the local broadcasting stations (2NC, Newcastle) and uses this frequently as an adjective!

My bird is called "Rus," a name he invented himself, as nobody has ever said it to him.

Note.—Since the above article was written Rus has departed for heavenly pastures, where, no doubt, he has already mastered the sound of the harp!

GROUPS AND GROUP EXCURSIONS

The Committee wishes to set out clearly the position regarding Discussion Groups and Excursions.

DISCUSSION GROUPS:

All Groups are open to all members of the Club; indeed, you are urged to join. There is no extra membership fee: we only ask for a sustained active interest in your Group.

Diary of Groups:

Geology Group (Mr. A. A. Baker, Hon. Sec.).

Meetings: Royal Society Hall, First Tuesday in each month.

Excursions: First Saturday following monthly meeting.

Rotary Group (Mr. H. C. E. Stewart, Hon. Sec.).

Meetings: Royal Society Hall, Fourth Monday in each month.

Excursions: Third Saturday in each month.

Marine Biology Group (Miss W. Taylor, Hon. Sec.).

Meetings: Royal Society Hall, First Friday in each month.

Excursions: As arranged and advertised in the *Naturalist*.

Nature Photography Group—in abeyance at present.

EXCURSIONS:

General Excursions are open to all members, friends, and visitors contemplating membership, with the proviso that, where transport or accommodation or both are limited, club members shall receive preference.

Group Excursions are open to all members of the Club, with the proviso that, where transport and/or accommodation are limited, members of the Group arranging the excursion shall receive priority.

As Group Excursions are usually planned to illustrate in the field, subjects studied and discussed in preceding Group Meetings, it is asked that non-Group members attending these excursions should acquaint themselves with any required preliminary information of the subjects under consideration, and not seek tuition at the excursion.

CONCERNING THE "BETTING-BIRD"

Recently I had an interesting cutting from a Singapore paper sent to me by a friend (Mrs. Jianne) of Singapore. The cutting reads as follows:

A friend told me she was much puzzled recently by the behaviour of a nightjar or "tok-tok" bird as most people call them. The bird was waddling over her lawn in a way which made her think at first that it was injured. She went a little closer, but the bird made no attempt to rise as they usually do; instead, it waddled faster than ever. Suddenly, to her surprise, a quaint little creature, rather like a baby game bird, peeped out from beneath the sheltering wings. The nightjar had been endeavouring to retreat complete with baby. Perhaps the little fellow found the pace too fast. Once or twice he tried to peep out and make a get-away; then mother pushed him back with her beak. It must have been a most entertaining performance.

Mrs. Jianne told me (whilst in Melbourne some time ago) that Singapore residents call this bird the "betting bird" as it "tap-taps" with its beak a great number of times, and men bet on the number of times it will "tap."

M. THORNTON SALTER.

[The bird discussed above, the Large-tailed Nightjar (*Caprimulgus macrurus*), also frequents North Australia and the islands, and in the former area is usually known as the Axe-bird, Hammer-bird, or Carpenter-bird, each name being based on the curious calls of "Chop-chop," or "Tok-tok." As in Singapore, Chinese in the islands used to make a practice of betting on the number of calls. The story of the nightjar "endeavouring to retreat complete with baby" strengthens a suspicion, long entertained by some of us in Australia, that nightjars may sometimes carry either their eggs or young away from supposed danger—EDITOR.]

WHAT, WHERE AND WHEN

General Excursions:

Saturday, October 11—Upper Beaconsfield. Subject: "Haunts of the Helmeted Honeyeater." Leader: Mr. A. S. Chalk. Travel by 7.40 a.m. train from Flinders Street. Fare: 3/3, 2nd class return. Bring two meals. Return from Beaconsfield 8.16 p.m.

Sunday, October 12—Maranoa Gardens. Leader: Mr. A. J. Swaby. Meet Gardens entrance in Kireep Road, 2.30 p.m. Take Mont Albert tram in Collins Street.

Sunday, October 19—Werribee (Melbourne and Metropolitan Board of Works Farm). Subject: "General and Birds." Leader: Mr. G. N. Hyam. Bus leaves Batman Avenue 8.30 a.m. Bus bookings, 3/3, with Mr. R. D. Lee, 18 Normanby Street, Middle Brighton, S.5.

Week-end, October 24-26—Bendigo. Parlour coach leaves 116 Flinders Street, 6.15 p.m. on Friday, October 24, returns to Melbourne Sunday evening, October 26. Total inclusive cost, 50/- to 55/-. Further particulars and bookings with Leader, Mr. H. C. E. Stewart (Tel. FU 022, extension 457).

Saturday, October 25—Kew (Johnston St. to Victoria St.). Subject: "Little-known Silurian Structures." Leader: Mr. R. C. Kershaw. Meet at Johnston Street Bridge, 2.30 p.m.

Saturday, November 1—Technological Museum. Subject: "Plant Products." Leader: Mr. R. H. Fowler. Meet Swanston Street entrance to Public Library, 2.30 p.m. Limit, 20 members. N.B.: Final of series arranged with Director of Museum.

Tuesday, November 4 (Cup Day)—Bacchus Marsh, Darley and Colindale. Subject: "Glacial Pavements." Leaders: Messrs A. A. Baker and P. Fisch. Bus leaves Batman Avenue 9 a.m. Bring two meals. Bus bookings, 5/6, with Mr. A. A. Baker, 53 Carlisle Street, Preston, N.18. Early booking essential.

Special Notices:

Saturday, November 22—200-mile day tour to Phillip Island, via San Remo and Newhaven, to visit Cape Woolamai (tide permitting). Subject: "Marine Life and General." Leader: Mr. P. Crosbie Morrison, M.Sc. Parlour coach engaged, reserved seats 20/-, and bookings with Mr. H. C. E. Stewart.

Ararat F.N.C. Wild Nature Exhibition, Ararat Town Hall, October 14-15. Members who can visit Ararat and assist please communicate with Mr. I. C. Hammett.

Group Fixtures:

Saturday, October 11—Geology Group excursion to University Geology School. Meet School entrance, University Grounds, 2.30 p.m.

Saturday, October 18—Botany Group excursion to South Morang. Train (Whittlesea line) from Spencer Street, 1.20 p.m. Fare: 2/-, 2nd class return. Return from South Morang, 6.3 p.m.

Saturday, October 18—Marine Biology Group excursion to West Melbourne Swamp. Leader: Mr. H. Preston.

Monday, October 27—Botany Group. Royal Society's Hall, 8 p.m. Subject: "Showy Monocotyledons," by Mr. J. H. Willis, B.Sc.

Monday, November 3—Geology Group. Royal Society's Hall, 8 p.m. Subject: "Glaciers, Past and Present," by Mr. P. Fisch. N.B.: Members please note change from the first Tuesday.

Friday, Nov. 7—Marine Biology Group. Royal Society's Hall, 8 p.m.

A. A. BAKER,
Excursion Secretary.

The Victorian Naturalist

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No. 767

PROCEEDINGS

The monthly meeting of the Club was held on October 13, 1947, the President (Miss Ina Watson) and about 180 members and friends attending.

The President announced the death on September 9, 1947, of a valued Honorary Member, Mr. James Searle.* Elected in 1885 and interested in microscopical science, Mr. Searle had lived at Narbethong since his retirement. Members stood in silence for a moment as a token of esteem to his memory.

It was further announced that the Australian Natural History Medallion Award for 1947 had been made to Mr. P. Crosbie Morrison and that the presentation would be made during the November meeting (at the National Herbarium) by Mr. Russell Grimwade.

On behalf of the Club, the President offered hearty congratulations and good wishes to our Honorary Member Mr. W. F. Gates, who had attained his 90th birthday. As Mr. Gates was absent from the meeting (a rare occasion) the Secretary was asked to convey greetings by letter.

The following were duly elected as Ordinary Members of the Club: Mrs. S. J. Dunn, Mrs. J. P. Bryce, Misses B. M. Allars and P. J. Lord; and as Country Members: Messrs. Donald H. De Meules (of Minnesota, U.S.A.) and C. Bottomley.

The subject for the evening was an illustrated lecture, "Nature Notes from the Middle East," by Mr. W. D. Chapman, M.C.E., M.I.C.E., M.I.E.Aust. Experiences during the two World Wars were recounted, from a natural history point of view, and were illustrated by a film strip, some 40 books, many maps and numerous specimens.

A vote of thanks to the lecturer was moved by Mr. F. S. Colliver, seconded by Mr. E. E. Lord and carried by acclamation. A summary of Mr. Chapman's very interesting address will appear elsewhere in the journal.

*An appreciation and short biography will be published in a succeeding number of the journal, also of the late R. H. Croll, ex-President F.N.C., who died on October 18th.—Editor.

AUSTRALIAN NATURAL HISTORY MEDALLION

Award for 1947

It would be superfluous to enlarge upon Mr. P. Crosbie Morrison's eligibility for this Award, or even to mention his more noteworthy contributions to the cause of natural history in Australia. Suffice it to say that there is hardly a hamlet in the Commonwealth, however remote, but could muster its band of people whose interest in nature study has been quickened through Mr. Morrison's very popular magazine, *Wild Life*, and/or by his regular broadcasts from 3DB.

Naturalists in general, and F.N.C.V. personnel in particular, will be happy to congratulate Mr. Morrison as recipient of the Australian Natural History Medallion for the current year. He rejoined the Club in August, 1937, after a lapse of several years, and was President for two consecutive terms in 1941-42 and 1942-43. Last year he was actually the F.N.C. Committee's nominee for the medallion, but very graciously declined in favour of Mr. George Lyell. The medallion will be presented to Mr. Morrison by Mr. Russell Grimwade at the November meeting of this Club.

Presentation of the 1946 Award

The Honorary Secretary of the Royal Society of Queensland (Miss Margaret I. R. Scott) has kindly forwarded an extract of the minutes of her Society's meeting on September 29th last, at which Mr. Heber Longman received the 1946 medallion. This extract reads as follows:

The Australian Natural History Medallion was presented to Mr. Heber A. Longman on behalf of the Field Naturalists' Club of Victoria. The Vice-President, in presenting the medal, referred on the one hand to the leading part Mr. Longman had taken in the scientific life of the community—twice President of the Royal Society of Queensland, twelve years as its Editor, Vice-Chairman of the Great Barrier Reef Committee, etc., as well as his long and successful career as Director of the Queensland Museum. On the other hand, he referred to the numerous (over 70) scientific contributions made by Mr. Longman, especially on fossil reptiles and marsupials, contributions which had received tributes from specialists throughout the world.

JUNIOR SHOW AT HAWTHORN

The excellence and popularity of an exhibition by Junior Branch members in the auxiliary hall, Hawthorn Town Hall, on October 6 and 7, were reflected in good attendances and nett takings of about £20. Much credit is due to Mr. and Mrs. J. J. Freame and Mr. S. R. Mitchell for organising this effort, and a special word of praise to the Fisch family, Doncaster, whose well-staged, comprehensive display occupied one whole end of the hall.

NATURE NOTES FROM THE MIDDLE EAST

(Summary of an Illustrated Lecture to the F.N.C.V., October 13, 1947)

By W. D. CHAPMAN, M.C.E., M.I.C.E., etc.

The operations of the A.I.F. in the Middle East extended on the mainland from well beyond Benghazi in Cyrenaica to the Turkish border in the north, out in Trans-Jordania in the east, and the war of movement certainly gave opportunities for travel.

Geology was very much in the clear. Owing to wind and water erosion, the exposures were many, although the rocks are masked in places by sand drift.

Interest was very soon directed to this science, for a letter from home drew attention to the interesting nature of the rocks of the Cyrenaican Plateau, including nummulitic limestones of Eocene Age, of which a full description would be found in the *Quarterly Journal of the Geological Society*, 1911.

These rocks, left bare by wind erosion, played havoc with vehicle springs and a supplementary description of them as detailed by ammunition lorry drivers who had to drive over them in the dark without lights, at an average speed of 15 miles per hour, with supplies for the Bardia "show," was sent home, but the description was never published!

This limestone had another distinct disadvantage in that it discouraged the excavation of slit trenches. An article written for the *Workshop News* entitled "'Oles I Have Dug" disclosed the information that "slit trenches for officers were two feet shallower than the others." "I know, because I have had to dig them," said the writer of the article.

On the way to Benghazi we passed quickly over Pleistocene, Oligocene and Eocene, over fault scarps and what not, and a few months later back again. The fault scarps made difficult obstacles where the roads had been blown, but I doubt whether the workshop recovery sections helping vehicles up the steep slopes were aware of the geological significance of their difficulties.

There was little doubt when we were on the Middle Eocene a few miles out of Barce. The weathered-out nummulites lying on the ground in profusion were nicknamed by our troops "pennies from Heaven," thus following truly their classical name.

Continuing on our way back to Egypt, the next occurrence to be mentioned is that of nummulites again, this time at the type locality, Giza. Near here, also at Abu Roash—just beyond the old Mena Camp of World War I—is a Cretaceous inlier containing cephalopod beds and a remarkable reef of the Hippurite, *Durania arnaldi*, a hundred yards or more in extent, several feet thick, with these fossils up to three or four feet long. A first guess

as a rugose coral reef can be excused. Interestingly enough, none of the cover valves have as yet been found, and that is the "poor excuse better than none."

Passing through the Delta, the crossing to Sinai would have necessitated a water crossing in Eocene, early Miocene and Pliocene times, but would have been over dry land in Oligocene, late Miocene and Pleistocene, this area having had its ups and downs.

After crossing the canal the railway makes for the coast, but we cross the belt of sand dunes on the slender bitumen tourist road built by an Australian. Cretaceous and Eocene are first encountered and the Jurassic of the Gebel Moghara shows up well on the left, but too far off to go collecting.

Special mention must be made of the Cretaceous fossil fish from Hadjula in Lebanon. Mentioned by Xenophanes, these, I believe, awaited re-discovery until comparatively recently.

Basalt is found in several areas including Galilee and the country beyond the Jordan, called Trachonites by the ancients. The manufacture of mill stones at Capernaum in ancient times was based on the supply of local vesicular basalt.

As to the Trachonites, no country more difficult for armoured fighting vehicles could be imagined than the "stony rises" similar to those near Colac. With volcanic hills, the basalt and tuff beds, Victorian River Red Gums round the settlements; and no camels or donkeys in sight at the moment (plus a fair imagination); one almost expected to see a Club excursion come along any minute.

Erosion is evident everywhere and even the normal, slow, natural erosion was faster than in most other parts of the world. In historical times there are outstanding examples such as the Lebanon Range denuded of its forests. Cyrenaica is another example, and much of this country which used to be the granary of Southern Europe is now denuded of soil.

The old trenches of the last war, between Beersheba and Gaza, have led to extensive gullying.

On the other hand, particularly where the strata are horizontally bedded, age-old terracing has been successful in retaining the soil over many centuries of cultivation.

More than 2500 species of plants are to be found in Palestine, Lebanon and Syria. Oleanders, hibiscus, cyclamen, ranunculus, poppies and anemones ("Lilies of the Field") are common. It must be admitted that some of our noxious weeds are found there also, but on the other hand many an original of the cultivated garden plants.

Cyperus papyrus has disappeared from Egypt, but still grows plentifully in Lake Hula, whence the Jordan flows. It is no longer used for paper, of course, but supplies a need for basket work and thatching.

Ancient olive trees must be mentioned, and some of these are undoubtedly 2000 years old, as for example those at Safad—"The city set on a hill, which cannot be hid"—and those in the Garden of Gethsemane, probably the only authentic scriptural locality near Jerusalem. In The Garden, our own kurrajongs are now associated with the old olive trees.

As well as kurrajongs, she oaks, silky-oaks and eucalypts are plentiful. These were described in a contribution to the *Quarterly Supplement to the "Gum-Tree,"* June, 1943.

On the matter of zoology we really give up, there being some 8000 species all told, including 6310 species of insects!

A few marine shells were collected while waiting for an overdue transport at Suez, when we wandered a few miles down the western shore of the Gulf.

We also collected a few at Sidi Barrani, in the early days. These have not been named, but have been carefully segregated because they may be distinct from those in the Gulf of Suez. One of the points of evidence as to those periods when the Red Sea and Mediterranean were joined is the similarity of marine shells in the deposits at those times. The Suez Canal has upset the Palaeontological plot for the future in the matter of fishes as some Indian Ocean species have found their way through to the Mediterranean, but this has not happened with the marine shells so far. One other source of material was a restaurant in Alexandria. The waiter still believes that one ate shells and all!

While by no means identical, the similarity between certain regions in the Middle East and Australia should be noted. Furthermore, what has happened to these regions in the way of desolation by the destruction of the forest cover and the depredations of the camel and goat in such low rainfall areas during several thousand years, is happening here remarkably quickly and, as we are well aware, needs far more control than we have exercised up to the present.

Another noteworthy matter is that the oft suggested flooding of our Lake Eyre Basin from the sea would have no more effect on the inland climate than does the Red Sea, the Gulf of Suez or the Gulf of Akaba on the surrounding regions.

DISTRIBUTION OF CERTAIN VICTORIAN EUCALYPTS

Eucalyptus fasciculata (Pink Gum) must be added to our Census, having recently been found in Kanawinka Psh., W. of Dergholme. *E. kybeanensis*, previously known only from the Mt. Skene-Useful area, now appears near Wulgulmerang, E. Vic. *E. crenulata* extends beyond the type area at Buxton to the Yarra Flats between Yering and Yarra Glen; *E. neglecta* (Omeo Gum) is to be added to the Dargo High Plains, while *E. Kitsoniana* (Gippsland Mallee) occurs also in the far S.W. Portland-Nelson section.—J.H.W.

ECKLIN HILL—A VOLCANO IN THE WESTERN DISTRICT OF VICTORIA

By EDMUND D. GILL, B.A., B.D.

Twenty-four miles east of Warrnambool and nine miles south of Terang is an interesting extinct volcano,* to which no reference has been made anywhere in literature, as far as the author is aware. On no map consulted has the high hill which is part of the volcano been given a name. However, the swamp which occupies the old crater is known as Ecklin Swamp,† and so it is here proposed that the hill be known as Ecklin Hill.

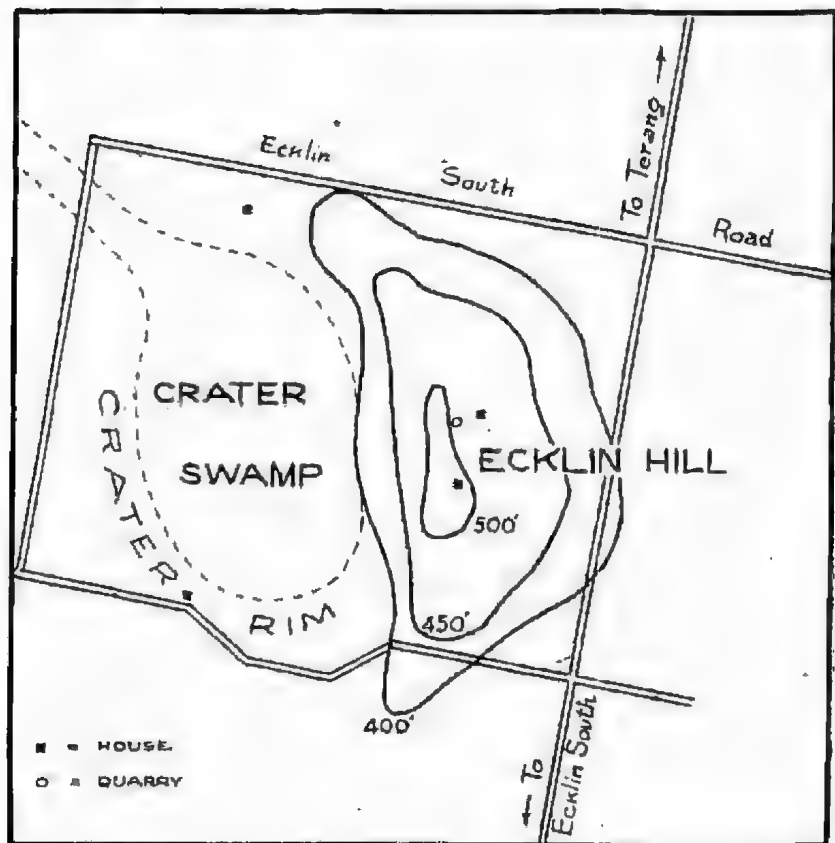


FIG. 1

Contoured map of Ecklin Hill and environs, based on military maps. The area represented is nearly $1\frac{1}{2}$ miles square.

Geomorphology

Ecklin Swamp is more or less circular where it occupies the former crater, but it also extends to the north-west. This linear area of poor drainage is an incipient creek connected with Mt.

* Military Map, 1 mile to 1 inch, Panmure Sheet, reference 826. 595.

† Military Map, 4 miles to 1 inch, Colac Sheet.

Emu Creek. When the latter has cut down further, there will be sufficient fall for a normal creek to flow between Ecklin Hill and Mt. Emu Creek. The crater swamp is over half a mile in diameter, and is hoggy for the greater part of the year.

To the west and south of the crater swamp there is a low rim, and to the east a very high one, constituting Ecklin Hill (see Fig. 1). To the north-west the rim fades out, thus allowing egress of swamp waters. The breach to the north prevents a lake forming, such as is present in so many of the craters of Western District volcanoes. The crater rim is steep on the inside, but on the outside there are long low slopes merging into the general terrain of the plain which surrounds Ecklin Hill.

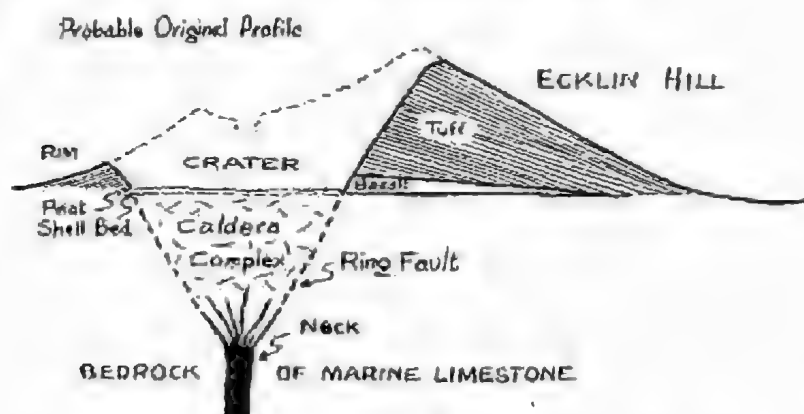


FIG. 2

Diagram of an ash volcano, after Wentworth (1926). The walls of the crater cannot be steeper than the angle of rest of the ash of which it is composed (cf. a dune), unless some kind of collapse eventuates.

The Crater

When the volcano ceased activity, the large crater began to fill with alluvium, and with an ever-thickening peat bed. Like most such craters in the Western District, it has a thick bed of peat in it. The cattle have trodden down the peat a good deal, leaving innumerable little "islands" of concordant summit level, which indicate the previous height of the deposit. Goudie (1942, p. 127) refers to similar effects in the Koo-wee-rup Swamp.

When the owner was fencing the swamp, he encountered a shell bed two to three feet below the surface of the swamp-land. On the occasions the writer has visited the site, the ground has been too wet to allow collection from this shell-bed.

Origin of Crater

The Ecklin Hill crater is very large, especially in view of the fact that the eruption was a comparatively small one. The volcano

is of the explosive type, and emitted ash and lapilli, but little basalt. The ejectamenta cover a more or less circular area about only one mile in diameter.

Moreover, the steep inner banks of the rim are at a far higher angle than the angle of the rest of the materials constituting it. Also the beds of tuff and lapilli have been truncated. The usual cross-section for an ash volcano is shown in Fig. 2, but there are no inward dips at Ecklin Hill. It is clear that the crater is one of negative type (Stearns and MacDonald, 1946, p. 14), and owes its large size to collapse. Fig. 3 provides a cross-section of the structure as interpreted from the outcrops available, and the information gained so far.



FIG. 3

Semi-diagrammatic section through the middle of the Ecklin Hill volcano. The horizontal scale is the same as in Fig. 2, but the vertical scale is exaggerated.

The top was not blown off the original volcanic hill, otherwise the heavy ejectamenta from such an event would be found round the volcano. Only fine tuff in very thin layers is found where the surface beds are exposed. It is a collapse structure, and such are common among the craters of western Victoria. The caldera of Tower Hill, between Warrnambool and Port Fairy, is well known, its sunken area being $1\frac{3}{4}$ miles in diameter. Mt. Warrnambool, near Pannure, is also a caldera whose ring fault is over $1\frac{1}{2}$ miles across. Wangoom Hill, a volcano E.N.E. of Warrnambool, is almost a replica of Ecklin Hill. Its caldera-like crater is three-quarters of a mile in diameter. Farther east, the lakes Keilambete ($1\frac{1}{4}$ miles in diameter), Gnotuk (1 mile), and Bullen Merri ($1\frac{1}{2}$ miles) are further examples of negative type craters with tuff rings round them. The great frequency of these collapse structures in the Western District suggests that the underlying marine limestone was generally rather weak in its resistance to the pressures of the volcanic forces.

The Tuff Ring

On the S.E. side of the crater there is a localized outcrop of basalt. This is probably the result of a minor effusive phase at the beginning of the Ecklin Hill eruption. Study of the district, has not been intensive enough yet to determine this point. However, the eruption was mainly (if not all) of the explosive type. The encircling ring consists of multitudinous layers of compacted

ash and lapilli. Banded tuff was collected from the eastern wall of the crater, but it is best seen in a quarry on top of Ecklin Hill (see Fig. 1). The section shows numerous layers of fine tuff, with occasional bands of small lapilli. Two basaltic bombs were noticed *in situ* in the tuff.

The Ecklin Hill volcano is notable for the very marked accumulation of ejectamenta on the east side of the crater. The volcano is not a maar, due to a sudden paroxysmal explosion. The multitudinous layers of fine ejectamenta show that there were very numerous eruptions over a period of time. The spread of these materials is due to winds modifying the original trajectory imparted by the explosive forces in the volcano. At Ecklin Hill there must have been strongly prevailing westerly winds to give so consistent a spread to the east. This phenomenon is not confined to Ecklin Hill, but is seen in a number of Western District volcanoes. An hypothesis to explain this was presented to the recent Perth meeting of A. & N.Z.A.A.Sc., and a paper on the subject is being published elsewhere. In short, it is that during the Pleistocene (Ice Age) the strong westerly winds now blowing over Tasmania and called "The Roaring Forties" moved north before the Antarctic ice-cap and blew over Victoria. If this hypothesis is correct, then Ecklin Hill is a Pleistocene volcano.

Judging by the stumps of large trees to be found, and the records of early writers, the tuff rings of the Western District volcanoes were originally covered with a thick forest. The roots of the trees were apparently able fairly readily to penetrate the tuff, and at the same time benefit from the plentiful plant foods contained therein.

The Crater Lake

Changes in the profile of the crater walls at Ecklin Hill, and the occurrence of peat high above the present water level, show that a lake must have once occupied the crater. The shell bed strongly suggests this too. Water could not now fill the crater to the higher levels, because of the breach in the tuff ring to the north. Apparently there was a comparatively deep lake in the crater at one time, and then the tuff ring was breached at its weakest point, and a cold lahar rushed along the low-lying country to the north-west into Mt. Etna Creek. (See Colac Sheet, 4 mls. to 1 in. Military Map.)

However, apart from such sudden releases of water, it is a notable fact that the lakes of the Western District are gradually drying up. Lake Wangoom was 20 feet deep, and local residents kept boats on it, but it is now dried up. Bonwick (1858) describes how it was then believed to be bottomless until some scientifically-minded person thought of testing its depth with a line! Lake Terang is another which has similarly been reduced to a swamp.

A farmer beside Lake Keilambete claims that it is receding at the rate of 3 feet per year. Former higher levels are clearly marked on the banks of Lakes Gnotuk and Bullen Merri. Tower Hill lake has receded to the S.W. corner of the caldera, although in this case the tapping of the waters of a large spring to supply the township of Koroit has been a contributory factor. The above are but a few instances of many that might be quoted of the gradual recession of lake waters. The causes have not been worked out, but they no doubt include long-range climatic changes, and the development of underground drainage through the limestone which constitutes the bedrock. The rapid increase of the recession in the hundred years of occupation suggests that the clearing of the land, insertion of numerous hores, and the introduction of vast herds of grazing animals to the area have had their effects.

The lakes also vary in their salinity, and this is an objective fact which is not without significance. However, it should be noted that the lakes vary greatly in their relation of cubic contents to surface (and so evaporation) area. There are lakes hundreds of feet deep, such as Bullen Merri (266 feet) and Gnotuk (103 feet), which have a relatively small surface area (Grayson and Mahony, 1910), while others are very shallow and have a relatively large surface area. It has been observed from the air that the lakes on the whole have a north-south lineation. This can be seen also in the 4 miles to 1 inch military maps. This is the general direction of drainage, but as so many of the lakes are volcanic features, it may also be an indication of structure in the bedrock.

LITERATURE REFERENCES

- Barnard, F. G. A., 1911. In the Western Lake District. *Vic. Nat.*, Vol. XXVIII (8), pp. 158-167.
- Bonwick, J., 1858. Western Victoria; Its Geography, Geology, and Social Condition. Geelong.
- Gill, E. D., 1943. The Geology of Warrnambool. *Proc. Roy. Soc. Vic.*, n.s., 55 (2), pp. 133-156.
- Goudie, A. G., 1942. A Survey of Soils and Land Utilization in the Parishes of Koo-wee-rup and Koo-wee-rup East. *Proc. Roy. Soc. Vic.*, n.s., 54 (1), pp. 93-130.
- Grayson, H. J., and Mahony, D. J., 1910. The Geology of the Camperdown and Mount Elephant Districts. *Rept. Geol. Surv. Vic.*
- Hart, T. S., 1901. Notes on a Visit to Tower Hill, Koroit. *Vic. Nat.*, Vol. XVII (9), pp. 157-160.
- Stearns, H. T., 1930. Geology and Water Resources of the Kau District, Hawaii. *U.S. Geol. Surv., Water Supply Paper* 616, pp. 141-157.
- Stearns, H. T., and MacDonald, G. A., 1946. Geology and Ground Water Resources of the Island of Hawaii. *Bull. 9, Hawaii Div. of Hydrology.*
- Wentworth, C. K., 1926. Pyroclastic Geology of Oahu. *Bernice P. Bishop Museum, Bull.* 30.
- , 1938. Ash Formations of the Island of Hawaii. *Third Spec. Rept., Hawaiian Volcano Observatory.*

ADDITIONS TO THE ORCHIDACEAE OF WESTERN AUSTRALIA—I.

Three New Species of the Genus *Caladenia* R.Br

By W. H. NICHOLLS, Melbourne.

I. *CALADENIA MAGNICLAVATA*, *sp. nov.*

Planta robusta, usque ad 35 cm. alta. Caulis hirsutus, uni-bracteatus. Foliū lineare vel lineare-lanceolatum, hirsutissimum, circa 25-30 cm. longum. Flores 1-2, magnusculi, lutei et purpurei. Sepalum dorsale erectum, leviter incurvum ad basin dilatatum, concavum, lineare-lanceolatum, magniclavatum, circa 4.5-5 cm. longum; lateralia sepalo dorsali similia, patentia. Petala retroflexa, anguste lanceolata, patentia, magniclavata, circiter 4 cm. longa. Labellum breviter unguiculatum, subovatum, marginibus pectinatis et denticulatis; calli lamina 4-seriati, lineares vel sessiles. Columna circiter 1.1-3 cm. longa, incurvissima, late membranaceo-dilatata, basi bicollata. Anthera breviter macronata.

A robust hairy plant about 30-35 cm high. Leaf-lamina linear or linear-lanceolate, hairy, about 25-30 cm. long; a loose subulate bract about the middle of stem. Ovary rather large, green, with fine silky hairs. Flowers 1-2, rather large, 7-8 cm. in diameter. Segments of perianth lanceolate, yellow or yellowish-green with a broad crimson or purplish stripe, dilated towards base, then contracted into a long clavate point which is yellow with minute darkly-coloured glands; dorsal sepal erect, incurved, the lamina lanceolate, about 4.5-5 cm. long; lateral sepals similar to the dorsal sepal, spreading. Labellum yellowish with reddish-purple markings, shortly clawed, ovate, the tip purplish, very dark, recurved; margins finely combed, purplish, anterior margins denticulate; lamina concave with fine divergent purplish veins; calli in 4 rows, linear "goli-stick" type, those towards the tip sessile. Column erect, incurved, about 1.1-3 cm. long, 2 yellow stalked glands at base, rather widely winged throughout, more so above. Anther with a short point.

Flowering August-September.

Distribution: Lesmurdie in the Darling Range, W.A. (Mr. and Mrs. W. H. Nicholls, Sept. 14, 1946—the HOLOTYPE lodged in National Herbarium, Melbourne.)

This *Caladenia* bears a superficial resemblance to *C. longiclavata* Coleman, but it differs materially in many particulars. It is a much more robust plant; the flowers are larger and coloured differently; the labellum is smaller and more prominently pectinate; the perianth-segments are more prominently clavate, in that the clavate portion is, in some flowers, fully half the whole length of the segment.

Found growing in limited numbers in gravelly ironstone country,

amongst heavy scrub of the Jarrah forest (and reported as being in greater numbers early in the month of August), this *Caladenia* was discovered through the guidance of Master Barry Brown of Lesmurdie.

II. *CALADENIA FERRUGINEA*, sp. nov.

Planta gracilis, hirsuta, circa 25-35 cm. alta. Folium lanceolatum, canaliculatum, circa 10-15 cm. longum; bractea subulata ad medium caulis. Flores 1-2, circa 6 cm. in diametro. Segmenta perianthii rubro-fusca, dilatata; sepalum dorsale erectum, incurvatum, clavatum; lateralia sepalis dorsali similia, patentia. Petala acuminata, nonclavata. Labellum breviter unguiculatum, dilatatum; marginibus fimbriatis et ad apicem recurvem, denticulatis. Calli atro-purpurei, clavati vel lineares, 6-seriati, leviter ultra medium laminae terminantes. Columna circiter 1.3 cm. longa, incurvissima indimidio superiore late membranacea dilatata, basi bicallosa; anthera breviter mucronata.

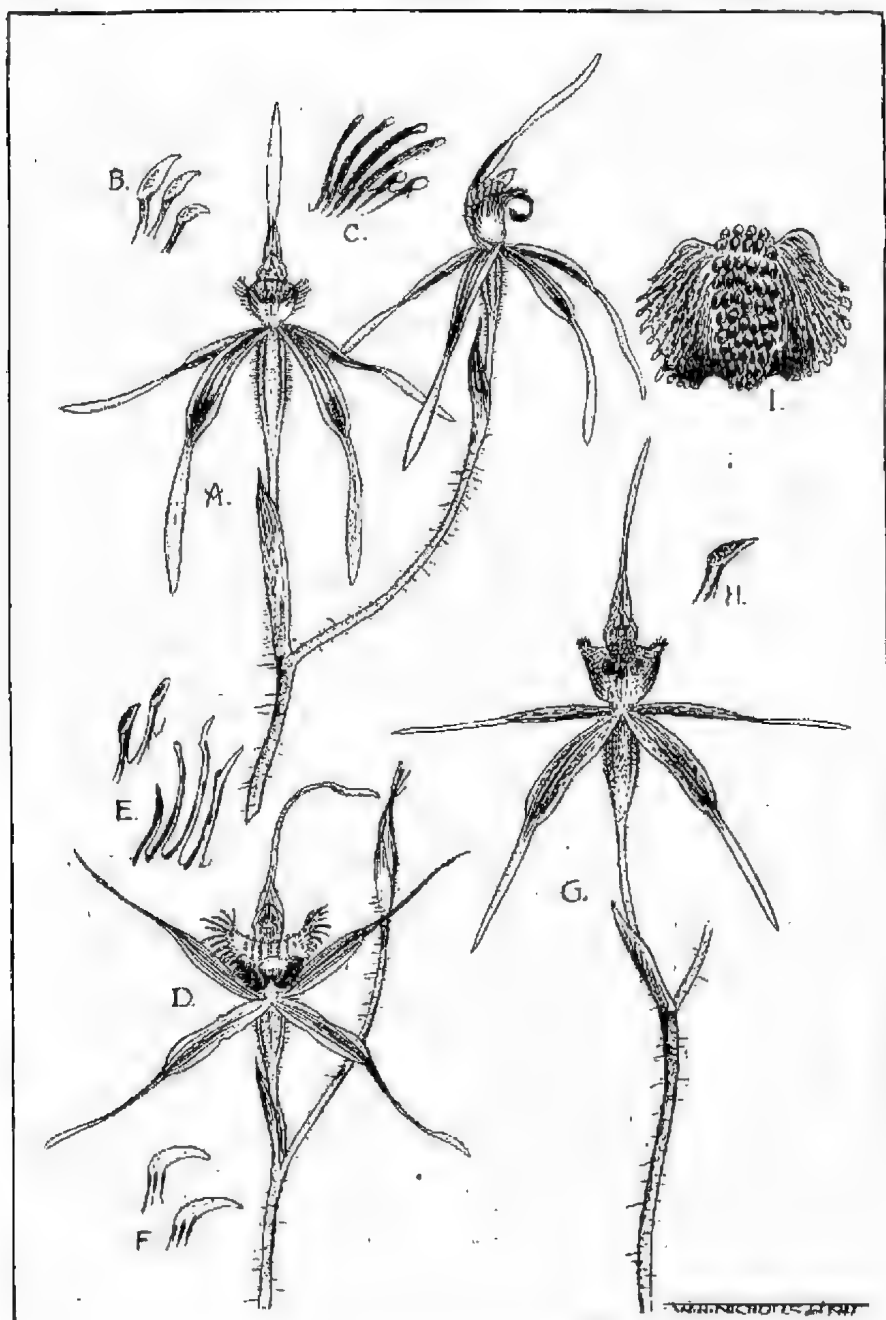
A slender, very hairy plant about 25-35 cm. high. Leaf lanceolate, channelled, about 10-15 cm. long, a single loose subulate bract about the middle of stem. Flowers 1-2, about 6 cm. in diameter. Perianth-segments almost wholly red-brown, widely-spreading (except the dorsal one); lamina dilated, then narrowing abruptly into fine acuminate points (petals), and shortly clavate points (sepals). Petals a little narrower than sepals.

Labellum on a movable claw, red-brown and white, broadly ovate or oblong, obscurely trilobed, about 2.2-3 cm. long and 1.1-3 cm. wide (without the fringe); margins entire near the base then prominently fringed, except towards the tip, where they are denticulate to the apex; lamina conspicuously marked with red-brown divergent lines and fine blotches, the tip wholly red-brown. Calli linear, "golf-stick" type, in 6 rows, extending a little beyond the bend, calli darkly coloured. Column erect, incurved, about 1.3 cm. long, widely winged on each side of the stigma. 2 sessile glands at the base. Anther with a short fine point.

Flowering September-October.

Distribution in W.A.: Armadale (W.H.N., Sept., 1946); between Yarloop and Cookernup (W.H.N., Oct., 1946); Waterloo (W.H.N. Oct., 1946)—TYPES in National Herbarium, Melbourne.

This species was found growing in fair numbers through scrub country in the three districts mentioned above. Other orchids found in association were *Caladenia Patersoni* R.Br., *Thelymitra crinita* Lindl., and *T. aristata* Lindl. It has affinities with *C. reticulata* FitzG., but differs in the much more prominent labellum fringe, which is quite in keeping with its more rigidly-spread, spider-like perianth segments.



Flowers and details of *Caladenia* Species

III. *CALADENIA ENSATA* sp. nov.

Planta robusta, hirsuta, circa 30-45 cm. alta. Folium oblongo-lanceolatum, hirsutissimum, 15-20 cm. longum. Caulis hirsutus, imbracteatus. Flores 2-4, magnusculi, lutei et purpurei, circiter 6 cm. in diametro. Segmenta perianthii lineare-lanceolata, ad basin dilatata, deinde in caudis ensiformis; sepalum dorsale erectum incurvatum, circa 4-5 cm. longum; sepalum lateralia patentia, reflexa, circa 4-5 cm. longa; petala patentia, circa 3-5-4-5 cm. longa.

Labellum breviter unguiculatum, suboblongum; apice multo recurvum, marginibus leviter irregularis serratis; lamina nervis atris radialibus ornata; calli lineares, curvi, 4-6 seriat, conferti leviter ultra medium laminae terminantes. Columna erecta, incurva, circa 1-3 cm. longa, superne latiuscule alata, basi bicallosa. Anthera obtusa.

A fairly robust, hairy plant about 30-45 cm. high. Leaf oblong-lanceolate, very hairy, 15-20 cm. long. Stem very hairy with a non-clasping subulate bract about the middle of stem. Flowers 2-4, rather large (about 6 cm. in diameter); segments yellow, each with 3 longitudinal purplish lines and blotches, 3-nerved, dilated in the proximal half, then contracted into long subulate fluted sword-like points which are yellow and finely glandular. Ovary with dark glandular hairs. Dorsal sepal erect, incurved, about 4-5 cm. long; lateral sepals similar, spreading and reflexed; petals shorter and narrower than sepals, horizontally spreading or reflexed.

Labellum on a short claw, somewhat oblong, apex much recurved; margins entire in the erect part, then very shortly and irregularly serrate; lamina decorated with red or purplish radial nerves and blotches; calli darkly coloured, linear, "golf-stick" type, densely crowded in 4-6 rows, and terminating just beyond the bend. Column erect, incurved, about 1-3 cm. long, widely winged on each side of stigma, with 2 stalked calli at base. Anther obtuse.

Flowering October.

Distribution: Abundant in very heavy scrub along the banks of King River, adjacent to "Ballymena" Guest House and on the granite slopes westward (1½ miles). Collected by W. H. Nicholls, Oct., 1946—TYPE specimens are in the National Herbarium, Melbourne. Affinities are with the South Australian *C. gladiolata*.

KEY TO ILLUSTRATIONS ON P. 137

A—Two flowers of *C. magniflora* sp. nov. B—Calli from labellum-lamina of A. C—Calli from margin of labellum of A. D—Flower of *C. ferruginea* sp. nov. E—Calli from margin of labellum of D. F—Calli from labellum-lamina of D. G—One flower of *C. ensata* sp. nov. H—Calli type from labellum-lamina of G. I—Labellum of *C. ensata* showing calli, etc.

(For natural size of flowers see descriptions.)

A TORTOISE FINDS HER FAMILY

By INA WATSON, Melbourne.

The following description of the manner in which a tortoise digs a nesting hole, lays the eggs, and camouflages the area afterwards, was told to me by Mr. Oliver Edgar, of Harrow. It is exceedingly interesting and, I think, well worth recording. Tortoises are comparatively common about waterholes in the Harrow district, and grow up to 12 inches wide. Here is the story as nearly as I can tell it in Mr. Edgar's own words:

"This event occurred several years ago, but I was so interested that I can remember all the details clearly. It was a hot day about the end of November, and I was riding through some dry grass when I saw the head of a tortoise moving about just ahead of me. I dismounted, tethered the horse, and crept back to watch what happened. The tortoise was about 8 inches across, and was slowly and deliberately working round in a circle so that the grass was teased up; she then grabbed the grass, pulled it off and piled it outside the circle she was making. The turning, teasing and pulling of the grass continued—working with alternate 'legs'—until the ground was cleared for a circle about 3-4 inches wider than her 'shell'.

"Then she started digging the earth, lifting the loosened soil out with her back flippers and piling it on the pulled up grass. When the ground got too hard to dig further, she then micturated and waited for the moisture to loosen the soil. This process continued until there was a hole about 4-5 inches deep, the entrance to the hole smaller on top and hollowed out under the surface. From the amount of moisture passed, the tortoise must have drunk all it could hold before leaving the water, which was about three-quarters of a mile away.

"She then laid 9 or 10 eggs and, when finished, one hind flipper was pushed into the hole and appeared to be arranging and settling the eggs.

"She next began replacing the earth from the outside of the circle, pushing it in gently at first, but as the hole filled, tamping it down more firmly. When the hole was filled up to ground level, the tortoise then lifted herself on her four flippers and flopped down on the loose earth, thus flattening and tamping it thoroughly. This performance was repeated several times.

"Finally, she collected the grass originally removed, and placed it over the earth, even pulling some fresh grass to add. When the camouflage was complete, she turned and made off for the swamp again. The whole process took nearly three hours.

"I was curious enough to uncover the eggs, and found they were about 1½ inches long, oval in shape, in colour blue-white, and

hard-shelled like a bird's egg. She had arranged them so that the smaller ends all faced toward the centre."

Mr. Edgar also tells of a boyhood incident. When aspiring to possess a polished tortoise "shell," he caught a tortoise, cut off its head, and placed the body on an ant hill for the ants to do the preliminary cleaning. The decapitated creature, however, was so lively that he fenced it in with sticks, only to find, next day, that it had completely disappeared. This happened again when he repeated the experiment. He asked how it was that anything minus a head could move so energetically.

Mr. Crosbie Morrison (to whom the question was referred) explained that, being cold blooded, tortoises are difficult to kill quickly, prolonged reflex action taking place after decapitation, although of course the action is undirected.

A REPORT FROM YOUR COMMITTEE

Apart from routine business, the following matters were reported and discussed at the meeting on 30/9/47:

Wild Flowers.—Correspondence was tabled in which protest had been made to the Forests Commission re the destruction of *Boronia* (*B. dentigera*) at Diamond Hill, Bendigo. Arrangements are in hand for broadcasts to be made from the National stations reminding listeners of the Wildflower Protection Act. Material for inclusion in the "This Will Interest You" Session is being prepared by several members.

Animals.—Correspondence to Geelong and Melbourne Harbour Trusts and the Public Works Department regarding illegal discharge of oil in the Bay, and consequent injury to penguins. Correspondence from Fisheries and Game Department and the Police, reporting that alleged cruelty to a kangaroo at an hotel at Corryong was without basis, and from Zoological Board, stating its policy was that animals were only allowed to be exported for exchange, and were never the basis of a cash transaction.

General.—Consequent on the announcement of the scheme for improvement of the Bay foreshore and widening Beach Road, members are investigating both locally, and through the Country Roads Board, so that no unnecessary destruction of native flora may occur.

Letters to Entomological Section of the Museum and various societies agreeing on the principle that future collecting expeditions should be given as much help as possible, but that type specimens should not be allowed to leave the country.

Member to investigate report of unnecessary destruction of native trees in road making and repairing at Garfield.

Members of the National Parks Sub-Committee have been obtaining replies and making enquiries regarding the present state of all the National Parks. As much information as is possible to obtain should be available by the end of November, and it is intended to hold a further meeting of representatives of allied societies to formulate a constructive policy to place before the Government.

Reported that arrangements had been made for the official request for the gazetting as National Forest the area at the Lower Glenelg to be presented to the Ministers for Lands and Forests.

—J.M.W. and F.S.C.

EXCURSION TO CRANBOURNE

By J. R. GARNET

Cranbourne appeared on the Excursion syllabus as an objective for March, 1934, but apparently the outing was never held. On September 12, 1936, one from Cranbourne to Frankston did take place—specifically for the study of pond-life and aquatic plants—but no printed report was made.

As far as I can determine this was the *only* occasion on which our Club had visited Cranbourne until September 13, 1947. On this recent excursion more than 30 members and friends spent 2½ hours in a pleasant, leisurely ramble through heathlands south of the township. The afternoon was sunny and warm, but orchids, the object of the excursion, were not much in evidence—had we explored the area perhaps a month later, many more representatives of the Family would have been seen in flower.

As a recommendation for future reference, it is suggested that an all-day excursion be arranged during October, when members would have more time at their disposal to study the general botany of this easterly outlier of the surely vanishing "Sandringham Heathlands."

The Cranbourne Racecourse is at present almost a replica of the Caulfield Racecourse of more than 30 years ago. By this, I mean that it still carries vestiges of native vegetation—vestiges, because most of it has been cleared very recently to allow the racegoers an unobstructed view. The Guinea-flowers, Common Heath, Wedding Bush and Beard Heaths are, however, springing up again and I imagine it will be several years before they are tall enough to warrant burning off again.

Near the eastern boundary of the course is a large shallow pond in which there were surely thousands of frogs, each croaking merrily and their united croaks making a perfect din. Mosquitoes were apparently absent from this particular area. As we left the lagoon to make our way along the Beaconsfield-Laingwarrin pipe track, toward the huge sand-pit, the first orchid was observed—*Hyperanthus nigricans*, in bud only, but I mention it because of certain unusual features. The single basal leaf of the flowering plant of this species is usually smaller than that found in the non-flowering vegetative state, and it is not usual for the plant to flower at all unless its habitat has been "burned off" in a previous spring or summer. This plant, however, was growing in a spot obviously untouched by fire for several years and its leaf was relatively large. *Hyperanthus nigricans* was seen, by its leaves, to be just as abundant and widespread in the Cranbourne heathlands as it is (or was) in the rest of the Red Sand area.

The significance of the expression "Red Sand," often used when referring to the greyish sandy soil of the coastal strip, was appreciated when the party viewed any of the several sand pits scattered throughout the Cranbourne heathland. The lower sand, with its infiltrated iron oxide, is distinctly reddish below a very shallow overburden of greyish sand; the grey colour is due to an admixture of humus, decaying vegetable matter and white sand, the latter being merely the original red sand from which the iron has been leached out.

In the absence of an expected abundance of orchids the party turned its attention to the general heathland flora and had cause to admire the beauty of the shapely bushes of the Pink Beard-heath (*Leucopogon ericoides*), which was abundant and in full bloom. Its congener, the Common Beard-heath (*L. virgatus*), and Common Heath (*Epacris impressa*) were well represented, while two other epacrids were seen—Pink Swamp-heath (*Sprengelia incarnata*) in a recently burned-off swampy area near the big sand pit. Hairy Aotus (*Aotus villosus*) was not yet in bloom, but likely to provide a delightful show in late October. The "Wild Parsnip" (*Trachymene arisocarpa*), which grew and flowered plentifully in the monster pits

of the scrub where eucalypts flourish, was the only representative of the *Umbelliferae* seen in flower.

It is pointless to attempt to specify the various plants noted, for probably more species were missed than were seen during the short time at our disposal; but, since the excursion was undertaken to examine the orchid flora, those species actually seen may be listed without encroaching on too much space. They include *Pterostylis instans*, *P. concinna*, *P. parviflora* (in fruit), *P. longifolia*, *Acianthus caudatus*, *Ac. exsertus* (with dehiscent fruits only), *Glossodia major* (in bud only), *Lyperanthus nigricans* (in bud only) and *Calceana major* (in leaf only).

In the shallow valley where the Mayfly Orchid (*Acianthus caudatus*) grew, among *Eucalyptus* and *Melaleuca* scrub, mosquitoes were so abundant and irritating as to hinder any prolonged investigation. [Members may be interested to know that a liquid known as Dimethyl phthalate is a very effective mosquito and sand-fly repellent when applied to any exposed parts of the body. Unfortunately we had none with us on this occasion.]

One of our younger members, in dodging the mosquitoes, blundered on to a Copper-head snake. He hounded off the reptile with such speed that he almost landed on a second one! However, all three escaped without further incident.

Of other forms of animal life, signs were not lacking that echidnas and wallabies were plentiful enough, although the animals themselves were not seen by any of the party.

The Heathlands Reserve Sub-committee (three members took part in the excursion) is interested in the possibilities of the area for the purpose of the establishment of a public heathland flora reserve and they are awaiting information concerning the status of the land tenure in and around the locality examined before pursuing the matter further.

Quite apart from its present interest, Cranbourne has (or rather, had) something of historical interest to naturalists. The famous series of Cranbourne meteorites came into prominence as far back as 1854 when No 1 meteorite (the largest, weighing 4 1/2 tons) was discovered. In 1862 it was removed under the supervision of the then Government Geologist, Mr. A. R. Selwyn (with the inveterate traveller, Dr. Geo. Neumayer, in attendance), and brought to Melbourne to be shipped finally to the British Museum, where it is now preserved in an atmosphere of nitrogen.

Since that time, nine other meteorites have been located in the district, all but one of them along a straight track, extending over several miles and roughly parallel to the present Frankston water supply pipe-line. The most recent discovery, was, I believe, made in 1928.

ANAKIE GORGE EXCURSION

Two buses and three cars took 60 members to Anakie Gorge on Show Day, September 25, for the Club Picnic. The Excursion Committee had made all arrangements, so of course the weather was perfect! Golden Wattle (*A. parranthea*) was out in profusion over the lower slopes of the Brisbane Ranges, and though flowers generally were not abundant, the Golden Bush Pea (*Pultenaea Gunnii*) made a good show in parts. One or two finds were of interest. The Velvet Daisy Bush (*Olearia pinnosa*) was found again, as was the Mountain Greenhood (*Pterostylis alpina*).

We were visited by a reporter and photographer during the afternoon, and their story appeared subsequently in *The Sun* of October 1, under "A Day With Nature." One felt, in conversation, that the reporter was disappointed that we were not queerer than she had anticipated.

I.M.W.

EPIPHYTIC ORCHIDS OF BASS STRAIT

In his paper to the October *Victorian Naturalist* (p. 117), the Rev. H. M. R. Rupp raises the question, "Two of the five (epiphytes) extend across Bass Strait to Tasmania; have they ever been looked for on any of the intervening islands?"

L. Rodway (*Flora Tas.*, 1903, p. 187) definitely cites "Bass Straits" for both *Sarcocylus australis* and *Dendrobium striolatum*. As to the former species, there is a collection from Dr. G. F. Story of Swansea, Tasmania, in the Melbourne Herbarium bearing the following note. "Some fine specimens were found on King's Island, Bass Straits, in the dense scrub bordering on the sea at Sea Elephant Bay in 1857." Thirty years later (Nov., 1887), during the F.N.C.V.'s official expedition to King Island, there was apparently no sign of *Sarcocylus*, although the naturalists stayed 17 days ashore and visited practically all parts of the island. It is extremely doubtful whether this epiphyte could have survived the last 60 years of clearing, grazing and repeated fires there, for King Island is now almost devoid of forest cover. I have never heard of *Sarcocylus* on any other island in Bass Strait, although the more mountainous parts of Furneaux Group would be worth combing for a record.

Referring to the ascent of 2350-ft. Strzelecki Peak on Flinders Island (*Vict. Nat.*, X, p. 175, Feb., 1894), Joseph Gabriel writes: "At an altitude of 1200 feet, we found a fine mass of the orchid *Dendrobium striolatum* measuring 10 feet by 7 feet, in full bloom, growing on a shelving rock." In the Melbourne Herbarium are collections of this Rock Orchid from Killisnoe on Flinders Island (Dr. J. Milligan, 1845 and 1847); also from the more southerly Clarke Island, collected by J. H. MacLaine in 1893. It would thus seem that *Dendrobium* inhabits only the eastern granitic portion of Bass Strait, connecting the Cape Howe-Genna region with Gould's Country and Oyster Bay, Tasmania, while *Sarcocylus* alone extends also to the western Straits, connecting (through King Island) the Otway Ranges with Circular Head, Emu Bay and Macquarie Harbour in N.W. Tasmania.

J. H. WILKS,

National Herbarium, Vic.

SUCCESSFUL SHOW AT ARARAT

A Natural History Exhibition staged in the Ararat Town Hall on October 14 and 15 reflected great credit on the activities of Ararat F.N.C. members, who were responsible for all arrangements. Attendances were good, especially of the local youth, and, in addition to proving a financial success, the exhibition should do much to further the ideals of nature study in that district.

Greetings from the F.N.C.V. in Melbourne were conveyed by a visiting member, who also delivered the evening lecture, and cultivated wildflowers from Mr. Ivo Hammet's garden at Ivanhoe occupied a conspicuous place. Other fine exhibits of Australian flowers came from places as far removed as Broken Hill, Cairns and Perth, while the Granipians were conspicuously represented.

Of outstanding merit were Mr. Stan Kelly's series of exquisite eucalypt paintings in water-colour, accompanied by actual flowering specimens from Mr. Hately's garden, a display of Dimboola wildflowers (and drawings) by Mr. and Mrs. Eric Muir, an elaborate project on the *Insecta* Class by Mr. Tom Binfield, and an exhibit of polished Australian timbers. Geological and ethnological subjects were also well represented, but neither mammals, birds, nor reptiles received adequate treatment—certainly, the difficulties of portrayal are much greater than with floral or geological material.

J.H.W.

A NEW NATIONAL MONUMENT

On Saturday, November 27 last, a pilgrimage of literati, headed by Miss Kate Baker, O.R.F. (founder of the newly constituted Australian Literary Commemorative Association) journeyed to Shepparton on the first public function of the Association. The objective was to unveil a bronze tablet on a native tree, planted many years ago by Joseph Furphy, the "Tom Collins" of *Such is Life*. The tree, a Wilga (*Geijera parviflora*), grows on the spot where the author lived and wrote most of his literary work. No more delightful setting for the creation of an Australian classic could be imagined. The original Furphy house has gone, likewise Joseph's writing den on the eastern bank of the Goulburn River. But the natural sylvan surroundings still remain: the splendid river red gums, with associated native under-shrubs, and many birds. Mr. and Mrs. T. B. Fawcett, who now live on the property, have preserved much of this wooded river setting in planning out their garden.

Appropriately, this fine Wilga was in flower, and just at the unveiling of the memorial by Mr. J. G. B. McDonald, M.P., a pair of Eastern Spinebills lifted in and out of the pendulous branches. Altogether, twelve species of native birds were seen or heard.

The F.N.C.V. was honoured by representation at the commemoration, which coincided with the 104th anniversary of Joseph Furphy's birth. Many messages from prominent Australians and writers were read including Club members Messrs. E. E. Pescott and R. H. Croll. The natural history proclivities of the author were mentioned as contributing largely to that flavour of "Australianness" in his work, and allusion was also made to his correspondence with Baron von Mueller. According to Miss Kate Baker, the Baron's letters had been regrettably lost. An acute observer, and before his time, Joseph Furphy showed a discriminating understanding of the Victorian aborigines. His sketch "A Vignette of Port Phillip" long remained in manuscript, but was recently published in a collection of "Twenty Great Australian Short Stories" by Dolphin Publications, Melbourne. Today, in this literary fragment, Furphy's anthropological concepts appear startlingly modern.

The historic tree, with the inscription thereon, has now been registered by this Club as a National Monument. It belongs to the Family *Rutaceae*, which includes the Correa of our Club badge, the boronias, the wax-flowers, the noble *Flindersia* trees and the exotic *Citrus* group. The genus *Geijera* (after J. D. Geijer, a botanical writer), is exclusively Australian and the species bears the aboriginal vernacular of "Wilga." Though not native to Shepparton, it occurs in north-west Victoria—in a very restricted area near Piangil and Narung. The foliage provides excellent sheep fodder in drought periods, and such use probably accounts for its diminution nowadays. The tree can be taken as expressive of Joseph Furphy's sound knowledge and intense regard for the Australian flora, and a confirmation of the influence of the botanist Mueller. No wonder Furphy summed up his own work as "offensively Australian."

No fence divides Mr. Fawcett's property from the street, and the Wilga stands close to the footpath, with the tablet a few feet from ground level. Nearby flourishes another Furphy tree, a Kurrajong (*Sterculia diversifolia*)—the identical species as the Furphy memorial tree in the Melbourne Botanic Gardens. This Kurrajong seeds freely, and seedling plants are nurtured by the Fawcetts and generously distributed to Furphians. Later, it is hoped to plant *Geijera Muelleri*, an allied species to the Wilga, in the vicinity, to signalize another historic link.

F.N.C.V. members visiting Shepparton are exhorted to view the tree, situated in Welsford Street, a stone's throw from the post office.

H. C. E. STEWART.

A NEW NATURAL HISTORY JOURNAL

It is pleasing to record that our sister Naturalists' Club in the West (founded in 1924) has now followed Tasmania's good example of last year by producing a journal. Apparently a quarterly publication of 24 pages is the objective, and two numbers of *The Western Australian Naturalist* have already appeared since June 18 last. The size is identical with our *Victorian Naturalist*, but excellent art paper has been used and there is a two-colour cameo of Kangaroo Paw (*Anigostanthos Manglesii*) on the outside cover—it is to be hoped that the modest price of one shilling will not preclude the maintenance of such a high standard.

A presidential announcement in Vol. I, No 1, informs us that the new journal is "not intended to be a magazine of popular natural history," but that "the matter published will represent the original work of our member field naturalists, . . . a contribution to the knowledge of our flora and fauna." Instructive information on the botany of Hill River district, artificial propagation of Christinas-tree (*Nuytsia*), bird life at Bilbarria, sea birds, breeding of the Black and White Fantail, lace-wings, jewel beetles and flying foxes has been given in the first two numbers. Congratulations, West Australia!

BIRD CHIT-CHAT FROM THE SUBURBS

To the toll of native birds, self-immolated against glass windows, must be added the Fan-tailed Cuckoo. On the afternoon of July 24 last, staff members in an office at the Explosives Factory, Maribyrnong, were startled by the thud of a bird that dashed itself to death against an outside window pane, one of a large expanse glazing the building. The dead bird, passed to me by Mr. Cyril Martin, had its neck broken. Its plumage was in good condition, so the bird was sent to the National Museum, where Mr. F. G. Elford found the bird's crop to be full of caterpillars.

The White-fronted Chat appears to be an all-the-year-round breeder. Mr. W. E. Vowles, of Moonce Ponds, has reported having discovered (on June 20) a nest of this species containing three eggs and built on top of a thistle in a paddock at Sydenham. The sitting bird was disturbed from the nest, and performed the usual "broken wing" lure.

Mr. Vowles later mentioned that on September 7 last, in the same vicinity, his dog accented the nest of a Striated Field-Wren. The mother bird evinced great distress, and the scattered nestlings fluttered about the grasses and low bushes, not sufficiently fledged to fly.

The aquatic bird population of Queen's Park lake, Moonce Ponds, is continuing the breeding life-cycle. The first to nest this season, in July, were the pair of Black Swans, which brought out six young. The lake remains the undisputed territory of the one pair. Last year they raised two broods, which were successfully driven away. It would be interesting to know what other sanctuary the young birds find.

On September 28, a Black Duck sailed round proudly with newly-hatched progeny. The same day, a pair of Little Grebe were observed at their floating nest, built very conspicuously about 40 feet from the eastern edge of the water. The three eggs could be plainly seen when the sitting bird stood up, preparatory to covering them in the characteristic mode before leaving the nest. During a few minutes of watching, both the birds came and placed fresh water weeds on the nest platform. The obvious position of the nest seems to be its best protection, as the many passers-by do not notice it, nor the sitting bird, which is not disturbed by them, or with the continuous traffic of trams and heavy vehicles along the road nearby.

H. C. E. STEWART

"AINT NATURE GRAND!"

"Bees," said the gardener, "that's what they be! And there's drunken bees there too! Too true, Mr. Morris, there's a liquid with a beer-like smell that attracts them. Man alive, you couldn't keep them back with bayonets after they have had a few sips!"

"Oh, come, come," I said. "Why not call the police?"

"B double E S—bees—insects—that's what I mean. It's perfectly true. I'll show you the tree."

At last I realized the gardener from the King's Domain was speaking entomologically.

From a sober glance at the tree (*Bursaria spinosa*, "Sweet Bursaria"), even an untrained entomologist could not fail to be attracted to the scene. The tree had copiously exuded a sweetish frothy substance having the aroma of good home brew of grandpa's vintage.

There were sober bees, bibulous bees, fighting bees—bees in all stages of intoxication. Emboldened butterflies attacked the bees. Maggots of the fruit fly gorged themselves. Two introduced species of fruit flies, the ferment fly, and other flies hovered around to deposit maggots or eggs.

The King's Domain is governed by the Melbourne City Council. Nature had not wholly acceded to the Lord Mayor's wishes regarding "beer gardens," for, away from the public's gaze, under the bark, were large numbers of the introduced brown "dried fruit" beetles (*Carpophilus*) and the native *Brachypelops* swilling and swelling in gluttonous abandon.

"My guess," I said, "is that the tree is affected with borer. The bountiful summer rain and the extraordinarily warm autumn have caused an excessive flow of sap, which became external through the borer holes. The sap was then acted upon by a yeast-like fungus, carried by the fruit or ferment flies, thus making a fermented liquor."

"Ain't nature grand!" said the gardener.

Then he jumped in the air, and, holding his bald head in agony, excitedly exclaimed, "Strike me pink—that's a wasp!"

I thought it best, as a botanist, to retreat to my own domain.

P.F.M.

NINE-YEAR-OLD ORNITHOLOGIST

The following curious item appeared in a recent issue of the *Sunday Telegraph* (Sydney):

"LONDON, Sat.—The Soviet Government has awarded a special scholarship to a nine-year-old Moscow schoolboy to enable him to write a 'large scale' work on Russian birds. The boy, Alexander Kischchinsky, has just finished writing and illustrating a 70,000 word treatise on birds. The Soviet News Agency says that Kischchinsky astonished his parents and teachers by learning to read when he was two, and to write fluently when he was three. 'He drew a map of the world with remarkable precision when he was four,' the agency adds. 'At the age of six he read a "monumental tome" of the animal world and became interested in zoology. This inspired him to write the 70,000-word treatise on birds which attracted the attention of Soviet authorities.'"

BOTANICAL MATERIAL WANTED FOR RESEARCH

Would any member able to obtain specimens of the genus *Pomaderris* (in flower or fruit, and preferably fresh), please communicate with Mr. N. A. Wakefield, State School, Cann River, via Orbost?

WARTIME ADVENTURES OF A SCIENCE PAPER

Two years before the war, under a small grant from the C.S.I.R., Mr. Tarlton Rayment wrote *A Critical Revision of the Zonata Cluster in the Genus Anthophora*.

This paper contained a revision of all known species in the Australian and Oriental Region, and Parts I, II and III, together with 1200 diagrams illustrating the anatomy of the bees, were dispatched to the Natural History Museum, Buitenzorg, Java. A week after their arrival at the Museum, the Japanese invaded and occupied the Netherlands Indies.

It was later reported by Indonesian Scouts that the Japanese had destroyed all scientific papers and that Dr. Van der Vecht and Dr. Liefinck, well known scientists, had died. It was not until twelve months after the cessation of hostilities that Tarlton Rayment learned that both Liefinck and Van der Vecht had survived.

Dr. Liefinck wrote from Beatrixlaag Internment Camp advising that the Japanese had seized and published Part I of the paper. This had been done by a Japanese scientist, Professor Naki of Tokyo University, and full credit was given to Rayment for his fine work. Two copies of this Japanese publication came to Melbourne and one was presented to the C.S.I.R.

In September, 1947, Part II came to hand, published by the Dutch authorities in Java. Part III was returned to the author for revision in July, 1947, and posted back to Buitenzorg the same month. Owing to further outbreaks of hostilities between the Dutch and Indonesians the manuscript was lost. Now, at the end of September, 1947, news has been received from Dr. Diakonoff that it has again survived the hazards of war and is in the hands of the printers! Tarlton Rayment is at present engaged on Part IV of this adventuresome revision.

LYNETTE YOUNG.

EXHIBITS AT OCTOBER MEETING

Mrs. H. Pink: *Grevillea Victorica*, from the Bogong High Plains.

Mrs. C. H. Edmondson: Garden-grown (from seed) specimens of *Acacia saligna* and *Indigofera australis*.

Mrs. Fenton Woodburn: Rocks, fossils and minerals from Central Australia.

Mr. C. J. Gabriel: Razor Shells (*Solen vaginoides* Lam.) from Western Port, Victoria, and *Solen signa* L. from England.

Mr. C. F. Lewis: *Coladenia praeceox* from Labertouche area.

Mr. E. E. Lord: Fasciated growth on *Rhus succedanea*.

Mr. R. C. Kershaw: New Zealand mollusca, including *Austrosipho adusta mandarinoides* Powell, *Struthiolaria papulosa* Martyn, *Struthiolaria vermis* Martyn, *Xenophthalmus collecta* Finlay, *Alciopora swainsoni* Marwick, *Darysipora australis* Sowerby, *Mureca punctulata* Martyn, *Helicostis virginea* Gmelin.

Mr. J. S. Seaton: *Boronia heterophylla*, *Verticordia plumosa*, *Isopogon roseus*, *Grevillea laurandulacea* (from Mr. Lofty, South Australia), *Heliotropium humile* (South Africa)—all garden-grown at Caulfield.

Mr. J. Ros Garnet: Dissected specimen of young Tiger Snake 8 inches long, showing how the reptile managed to swallow another Tiger Snake of the same length. Cultivated indigenous orchards in flower, viz., *Dendrobium aemulatum* (N.S.W. and Qld. epiphyte), *D. striatum* (Tas. and Vic. lithophyte; specimen coll. East Gippsland, 1939), *D. linguiforme* (N.S.W. and Qld. epiphyte, last exhibited about 10 years ago). Garden-grown native plants, including *Prostanthera melastifolia*, *Grevillea olcoides*, *Kennedyia rubicunda*.

WHAT, WHERE, AND WHEN

General Excursions:

Saturday, Nov. 8—Botanic Gardens. Subject: "General Botany." Leader: Mr. A. Burke. Meet at National Herbarium Gate (main entrance to Gardens) 2.30 p.m. Beginners and new members especially welcome.

Saturday, Nov. 15—Altona Salt Works (in conjunction with members of Botany and Marine Biology Groups). Subject: "Salt Marsh Flora and Marine Life." Leader: Mr. R. D. Lee. Travel by 9.25 a.m. train from Spencer St., platform 5. Single fare 1/6 to Laver-ton, thence bus to ammunition dump. Return, by bus to Altona, thence train to Melbourne; single fare 1/1, bus about 2/6.

Saturday, Nov. 22—Phillip Island. 200-mile day tour, via San Remo and Newhaven. Cape Woolamai may be visited, circumstances per-mitting. Subject: "Marine Life and General." Leader: Mr. P. Croshie Morrison, M.Sc. Coach leaves Batman Avenue 7.45 a.m. Bring two meals. Parlour Coach is fully booked with advance reservations, which must be paid for by 10th November, otherwise seat will be cancelled. Fare 20/- return, and bookings with Mr. H. Stewart, 14 Bayview Terrace, Ascot Vale (Tel. FU 022, ext. 457).

Saturday, Nov. 29—Frankston (in conjunction with Anthropological Society of Vic.). Subject: "Aboriginal Kitchen Middens, and Geology." Leaders: Messrs. F. S. Colliver and R. C. Seeger. 9.48 train from Flinders St. Bring two meals.

Saturday, Dec. 6—Evening Walk, Yarra Boulevard at Studley Park. Subject: "Astronomy and General." Leader: Mr. E. E. Lord. Meet 7.30 p.m., Johnston Street Bridge (Abbotsford, Kew). If possible, bring telescopes, binoculars, and good torch.

Special Notice:

Saturday, Dec. 13—Kingleake National Park. Leader: Mr. A. A. Brun-ton. Nash's bus leaves Batman Avenue 9 a.m. Bookings (5/6 return) with Mr. R. D. Lee, 18 Normanby St., Brighton, S.E.

Group Fixtures:

Friday, Nov. 7—Marine Biology Group. Royal Society's Hall, 8 p.m. New members welcome. (Hon. Sec.: Miss W. Taylor, 13 Jolimont Square, Jolimont, C2.)

Monday, Nov. 24—Botany Group. Royal Society's Hall, 8 p.m. Sub-ject: "Grasses and Sedges."

Tuesday, Dec. 2—Geology Group. Royal Society's Hall, 8 p.m. Sub-ject: "Geology Quiz."

Friday, Dec. 5—Marine Biology Group. Royal Society's Hall, 8 p.m. Further particulars from Hon. Sec. of Group.

Saturday, Dec. 6—Geology Group. Proposed visit to Geological Survey Museum, Gisborne St. Further particulars at meeting.

A. A. BAKER,

Excursion Secretary.

A.N.Z.A.A.S. Meeting at Perth

At the Botany Discussion Group on October 27 Mr. P. F. Morris gave some account of the Conference sessions to which he was Club delegate; also an address on West Australian vegetation, with a series of beautiful colour slides to emphasize its peculiarities, amazing variety and charm.

The Victorian Naturalist

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No. 768

PROCEEDINGS

The monthly meeting of the Club was held at the National Herbarium on November 10, 1947, the President (Miss Ina Watson) and about 200 members and friends attending.

The President announced the death of an esteemed Honorary Member and Past President, Mr. R. H. Croll, and also of a valued friend, Miss Ingram. Members stood in silence for a moment as a mark of respect to their memory.

A welcome was extended to all visitors from kindred societies attending the presentation of the Australian Natural History Medallion, and special mention was made of Mr. H. Best and our Hon. Member Mr. C. French, who were associated with Baron von Mueller in his latter years.

The following were elected as Ordinary Members of the Club: Mesdames R. S. Hart, Dobson and F. W. Faulkner, Mr. and Mrs. A. Riddell, Misses M. Blanford, F. D'Arcy, A. Campbell, and Mr. K. Atkins; as Country Members: Miss G. Lewis, Messrs. A. J. and K. A. Gray, and O. Edgar; and as Associate Member: Master Graeme Riddell.

Presentation of Australian Natural History Medallion

Mr. Russell Grimwade, before making the presentation, stated that he was pleased indeed to have this honour, as he had followed the achievements of the recipient, Mr. P. Crosbie Morrison, from school days to the University and up to the present time. No one was doing more to popularize Natural History throughout Australia and there was no doubt that the choice of the Selection Committee would be widely approved.

Mr. Morrison thanked Mr. Grimwade, Mr. J. K. Moir (the donor) and members of the F.N.C., stating that he was very conscious of the honour received. He looked forward to many more happy days in the Club.

Mr. A. W. Jessep, Government Botanist and Director of the Botanic Gardens (by whose courtesy we had the use of the Herbarium Hall for this meeting), supplemented the remarks of Mr. Grimwade by reference to the work Mr. Morrison had done in producing the Gardens Centenary book, which had been generally appreciated.

Ferdinand von Mueller

Next month being the 100th anniversary of Baron von Mueller's arrival in Australia, Mr. J. H. Willis delivered a Centennial Address, summarizing the principal events in the great botanist's life—his journeyings, writings, and the misfortunes that he surmounted so magnificently. The thanks of the Club were accorded Mr. Willis by hearty acclamation.

Mr. Best gave several reminiscences of his happy associations with von Mueller, and letters were read from Mr. C. Daley (still in hospital) drawing attention to his long correspondence with the Baron and his Memoir—at present the only biography of Mueller ever published—and from Miss Cecil Harris, of Perth, a surviving great-niece of the Baron's, conveying greetings and best wishes to the meeting.

Mr. H. C. E. Stewart mentioned that at a Bendigo excursion recently members had visited the Art Gallery and admired an ornate vase, once presented to Baron von Mueller by the Czar of Russia.

EXHIBITS

Mr. J. R. Garnet: Copy of *Flora Australensis* (Vol. 6) with many annotations and marginal notes pencilled by the Baron.

Mr. C. J. Gabriel: Marine shells—*Pitaria lupanaria* Lesson and *P. difoné* L. from Central America.

Mr. A. A. Baker: Collection of specimens from Comradai, including bone fragments, leaves, concretions, dolomitic travertine, eposomite and glacial pebbles.

Mr. J. Ros Garnet: Native shrubs—*Pimelea ligustrina* and *Isradia achillaeoides*, both garden-grown.

Mr. J. S. Seaton: *Meibomia Steedmani*, *Boronia pinnata*, *Leptospermum scoparium*, var. *Lambethi*, all garden-grown.

National Herbarium: Collection of Mueller relics.

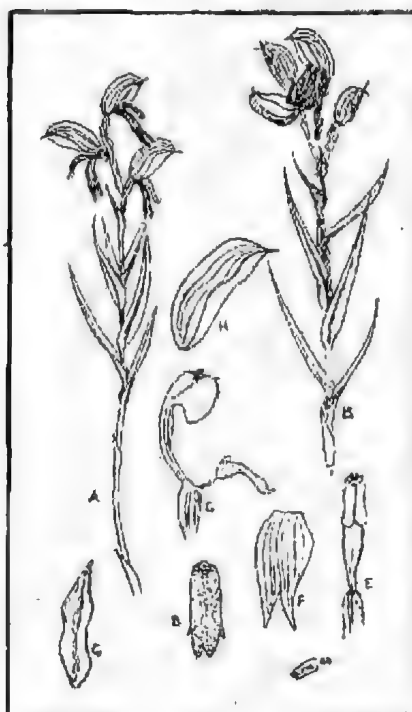
MYSTERIOUS "PLAYHOUSE"

A few years ago we had a mystery here which we failed to solve. It was a wonderful playhouse for something. It was only used one season and has since fallen to decay. After absence from the gully for some time owing to illness, I went down one day and was surprised to see a well-defined path, which I knew was not made by man, leading from the stream. I followed the path up the hill into thick scrub and came to an elfin arena about four feet square. All the wire-grass and creepers had been pulled down in the forming of the square. Daily I watched this playhouse until there were eleven "rooms" in all, one communicating with another, and even having earthen steps in places where the level caused them to be needed. The whole thing was evidently the work of some creature or creatures of the night, for nothing was ever seen at work. We were all fascinated, yet nobody could tell me what made the playhouse. Perhaps some naturalist can oblige?—(Miss) Amy L. Laycock, Sassafraz.

A DRY-LAND FORM OF *PTEROSTYLIS LONGIFOLIA*

By E. T. MUIR, Dimboola.

The typical form of the Tall Greenhood Orchid is a plant of varying dimensions, ranging from 15 to 90 cm. in height, but the form under discussion is a consistently dwarf plant. The rather crowded arrangement of the flowers and leaves along the upper third of its axis resembles that of Lindley's *P. vittata*; in the typical form the leaves and flowers are more widely spaced. The



A and B—Plants half natural size (B is shortened). C—Column and labellum (side view). D—Labellum (front view). E—Column (from front). F—Lower sepals. G—Petal. H—Calyx. [All dissected parts enlarged]

labellum is remarkable for its wholly green colour and its almost glabrous surface, the striking pubescence of the typical form being represented merely by a sprinkling of extremely short marginal hairs. The appendage, of a darker shade than its surroundings, is more conspicuous than typically and in some flowers is quite definitely inclined forward. The apex of the labellum is almost comparable with that of *P. concinna* R.Br., its incision being deep and wide as in an old-fashioned boot-jack.

My first specimens of the dwarf form were collected on August 20, 1946, in the new Reserve for Flora and Fauna at Dimboola. Under the impression that it was typical of *P. longifolia*, a specimen was forwarded to the Rev. H. M. R. Rupp of New South Wales. This example was obviously past its prime, because Mr. Rupp immediately asked for a further specimen, stating that it was probably a new entity.

With the arrival of fresh material, and after consulting other orchid students, he decided that the variations from type were consistent enough to warrant a varietal name. In view of the crowded arrangement of the flowers and leaves, *congesta* would have been an appropriate epithet. Messrs. W. H. Nicholls and

J. H. Willis, who know the Tall Greenhood well over a wide range in Victoria, were further consulted and they advised against the publication of a new variety—*Pterostylis longifolia* is extremely variable in size, colouring and density of the inflorescence, and dwarf conditions are not uncommon among normal colonies of the plant, especially where there is a local deterioration of the soil. Consequently I have decided not to describe my plant as anything new; but notes on an interesting *forma congesta* may be worth recording.

I collected three specimens, leaving the remaining six in the Reserve to be pollinated and to catch, if possible, the insect responsible. When Mr. Rupp requested a second specimen, someone had collected five of these!—the sole survivor was only a single-flowered specimen. Surrounding the colony, there were quite a number of juvenile plants, which were probably those of the dwarf *P. longifolia*, although they could be *P. robusta*, which is locally plentiful. A fortnight later I collected two specimens at Diapur, 30 miles closer to the South Australian border. It is possible that there were more there, but I had little time at my disposal to search for further specimens. It is most probable that there will be other colonies at Diapur, in the Lawloit Ranges between Diapur and Yanac, and along the fringes of the Little Desert.

HISTORICAL PHOTOGRAPHS OF BIRDS

In writing a full-page review for *Nature* (June 7, 1947) of the recent British book, *Masterpieces of Bird Photography*, by Eric Hosking and Harold Lowes (Wm. Collins, Sons & Co., London, 1947) Mr. Seton Gordon concludes: "This is one of the most interesting bird books that have been published for a long time."

Victorian bird-lovers will look forward to the enjoyment of this twelve-and-sixpenny work, with its 63 plates, many being of the greatest historical value. It is claimed that a lapwing study, photographed by R. B. Lodge in 1895, represents the first photograph ever taken of a bird on the nest. Such a claim, however, is disproved by reference to our *Victorian Naturalist* for February, 1894, wherein a photograph is reproduced for the first time in the journal. It is an excellent picture of gannets on their nests at a Cat Island "gannetry," and was exposed by Mr. H. P. C. Ashworth on November 20, 1893, during the F.N.C. expedition to Furneaux Group, Bass Strait.

EDIBLE SPIDERS

"I know of no mineral analysis of spiders. The only analysis I have made was of a Siamese spider which is much appreciated as an item of human diet. The flavour is palatable, and the protein content high."—W. S. Bristowe, in answer to a correspondent, *The Countryman* (England), Vol. 35, No. 1, 1947.

ERRATUM—The illustrations appearing as figures 2 and 3 (pp. 131 and 132) in the November number of the *Victorian Naturalist* should be transposed.

A KEY TO THE IDENTIFICATION OF AUSTRALIAN SNAKES

(OTHER THAN BLIND SNAKES, ROCK SNAKES AND
PYTHONS, FILE SNAKES, AND SEA SNAKES)

By R. A. HUNT, Texas, Queensland.

From time to time, excellent articles have appeared on the snakes of a particular district or State, e.g., "Snakes" by R. A. Black in *The Australian Naturalist*, viii, 50 (July, 1930) — an illustrated account of the three Tasmanian species; but we lack a good key to the ophidian fauna of the whole Commonwealth. With a view to making good this deficiency, I venture to submit the following scheme, based upon my own experience and valuable information contained in the three standard works:

Snakes of Australia, J. R. Kinghorn.

Australian Snakes, E. R. Waite.

Reptiles and Amphibians of South Australia, E. R. Waite.

Thanks are extended to Mr. J. R. Kinghorn and Mr. Brayton Eddy (of the N.Y.Z.S.) who kindly checked my "key," giving their opinions on it.

METHOD OF APPLICATION OF KEY

(1) Note whether the ANAL PLATE is entire (A1) or divided (A2). This will select a group of columns.

(2) Count the number of scales around the body. These will be any odd number, from 13 to 29. The number counted will select a down column (S).

(3) Count the number of scales from the chin to the ANAL PLATE. These are called VENTRALS (V). The number will fit one of the sets in the central column marked (V), thereby determining a cross column, which makes a square with the (S) column.

(4) Within this square is a group of numbers. These numbers coincide with the numbers of the snakes in the accompanying notes. By comparison of these notes, such factors as the condition of the subcaudal scales (SC) and the colour will eliminate species until the correct one has been determined.

The notes include information on the venomousness, colour, scalation and distribution of 79 species and 7 varieties (4 known from single specimens only). If there is no accepted vernacular name, a question mark (?) will precede the scientific epithet.

NOTES ON AUSTRALIAN SNAKES (TO ACCOMPANY THE KEY)

1. FRESH-WATER SNAKE (*Natrix mairii* Gray). Non-venomous.

Colour: Very variable. May be from grey to a rich brown, with markings of many kinds. Often reddish spots on the sides. Belly scales are usually salmon-pink.

Scalation: S 15-17. V 130-160. SC 52-80. A 2.

Northern Australia.

TABULAR KEY

A1					VENTRALS	A2								
S15	S17	S19	S21	S23		S13	S15	S17	S19	S21	S23	S25	S27	S29
41	75		39	39	110-120		44							
41, 38	30 59 60 76	30 82	30	39	121-130		1 44 86	1						
30 62 63 64 72	36 59 60 76	36 82			131-140		1 10	1		9		5 8 10	5 10	10
62, 63 64, 67 72	67		40		141-150		1 15 19 40	1 43 45 65 70			4	4	5 8 10	5 10 10
62, 63 38, 64 67, 72 77	21 61 67	78			151-160		1 15 19	1, 42 43, 45 65, 70			4	4	5 10	5 10 10
68 69 72 73	21 35 61	78		33	161-170		1, 14 17, 19 22, 25 27, 74	1, 13 18, 42 43, 45 65, 66 70						
61, 68 69, 71 73				33	171-180	6	14, 10 17, 19 22, 23 27, 64	13 51						
32, 61 68, 69 71	50	37			181-190	6	14, 16 17, 22 27, 28 83, 84	20 24 23 30 51	20 54	20				
68			79		191-200	6 7	16, 17 22, 27 23, 31 83, 84	20, 24 29, 48 49, 51 52 64	24 20 52 64	24 20				
	2		79 81		201-210	6 7	17, 22 27, 28 31, 83 84	20, 24 26, 29 48, 49	24 20 20	24 20 23				
	3		79 81	34	211-220	6 7	17, 22 27, 28 83, 84	20, 24 25, 29 48, 53	20 24 24	24 20	57			
			81	47	221-230		17 27 28 84	20 56	20	20	57			
		11 12	11, 12 58 80	12 47	231-240		17 27 84				55			
		11, 12	11, 12	12	241-250		17, 27							
		11, 12	11, 12	12	251-260		17, 27							
					261-280		85							

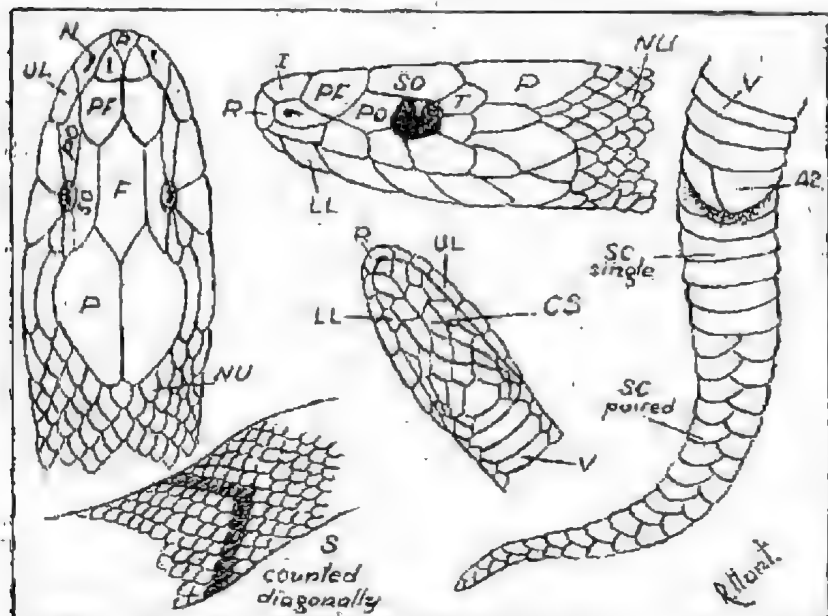
2. **HOODED SNAKE** (*Stegonotus cucullatus* Dumeril and Bibron).
Non-venomous.
Colour: Light brown on the upper surface, with a dark central stripe commencing behind the head. Yellowish below. The lateral scales have brown spots.
Scalation: Two upper labials enter the eye. Loreal scale present. 10-11 upper labials. Parietals twice as long as the prefrontals. S 17. V 194-208. SC 73-90 pairs. A 1.
North-eastern Australia.
3. **HERBERT RIVER SNAKE** (*Stegonotus plumbeus* Macleay). Non-venomous.
Colour: A uniform black or lead colour above, and yellowish white underneath. Subcaudals each have a black base.
Scalation: Frontal shield broad and short. Three labials enter the eye. Nine upper labials. S 17. V 219. SC 74 pairs. A 1.
4. **MACLEAY'S WATER SNAKE** (*Hyposirhina macleayi* Ogilby).
Venomous, but not dangerous.
Colour: Dark olive to black with a yellowish white line on each side. General appearance very distinctive.
Scalation: S 21-23. V 147-152. SC 38-47 all single. A 2.
Northern Australia.
5. **SPOTTED WATER SNAKE** (*Hyposirhina punctata* Gray). Slightly venomous.
Colour: Head brown, upper labials white. Upper surface dark brown, with lines and spots or blotches. Under parts whitish. Zigzag dark brown stripe through subcaudals.
Scalation: One or two loreal shields present. 12-14 upper labials. S 25-27. V 135-156. SC 28-41 paired. A 2.
Northern Australia.
6. **NORTHERN GREEN TREE-SNAKE** (*Dendrophis calligaster* Gunther). Non-venomous.
Colour: Green on the upper surface, rich yellow to white below. Black streak from the side of the snout through the eye.
Scalation: S 13. V 176-200. SC 120-150 single. A 2.
Northern Central Queensland and Cape York.
7. **GREEN TREE-SNAKE** (*Dendrophis punctulatus* Gray). Non-venomous.
Colour: Usually a brilliant green above and yellow below. Black and white markings on the skin under and between the scales.
Scalation: S 13. V 191-220. SC 120-144. A 2.
Eastern Australia.
8. **ROCKADAM** (*Cerberus australis* Gray). Harmless.
Colour: Leaden grey above, with irregular black spots. Dark streak on the side of the head. Under parts yellowish white.
Scalation: Parietal shields broken up into small scales. S 25. V 148-150. SC all paired.
A water snake restricted to northern Australia.
9. **RICHARDSON'S WATER SNAKE** (*Myron richardsoni* Gray). Slightly venomous.
Colour: Grey or olive above with black irregular cross-bands. Head blackish. The under parts yellowish, with central dark streak.
Scalation: Nasal divided. Loreal present. Internasal single and triangular. Nine upper labials. S 21. SC 30-35 pairs. A 2.
North-western Australia.

10. **WHITE-BELLIED WATER SNAKE** (*Fordonia leucobalia* Schlegel).
Slightly venomous.
Colour: Variable. May be black above with or without yellowish spots, or reddish above with a black vertebral stripe, or brown with black spots.
Scalation: I single. UL 5. S 25-29. V rounded. SC 26-43, mostly paired. A 2.
Northern Australia.
11. **BROWN TREE-SNAKE** (*Boiga fusca* Gray). Slightly venomous.
Colour: Any one of several shades of brown, crossed with many thin, irregular, blackish bands.
Scalation: The preocular does not join the frontal. S 19-21. V 226-251. SC 87-103 pairs. A 1.
Northern and eastern Australia.
12. **NORTHERN BROWN TREE-SNAKE** (*Boiga irregularis* Merrem).
Slightly venomous.
Colour: As for 11.
Scalation: The preocular reaches the frontal. S 19-23. V angulate. SC 103-125, mostly paired. A 1.
Cape York (N.Q.).
13. **BROWN-HEADED SNAKE** (*Glyphodon tristis* Gunther). Venomous, but practically harmless.
Colour: Dark brown.
Scalation: Internasals half as long as the prefrontals. Frontal twice as broad as the supraoculars. Upper labials join the prefrontal. S 17. V 165-179. SC 38-52, paired, or a few anterior ones single. A 2.
N.E. Australia.
14. **RED-BELLIED SNAKE** (*Pseudelaps squamulosus* Dumeril and Bibron). Venomous, but practically harmless.
Colour: Dark brown or black above, with an orange or yellow band round the snout to the neck. The lower parts are salmon-red and may be spotted with black.
Scalation: S 15. V 170-185. SC 35-50, in pairs. A 2.
Coastal plains and ranges of S.E. Australia.
15. **KREFFT'S DWARF SNAKE** (*Pseudelaps krefftii* Gunther). Venomous, but practically harmless.
Colour: Blackish-brown above, a yellow band on the nape connecting with the yellow colour on the side of the head. The under surface is whitish, the plates being edged with brown. Brown central stripe under the tail.
Scalation: Nasal in contact with the preocular. S 15. V 145-156. SC 26-38 pairs. A 2.
Queensland and northern New South Wales.
16. **WHITE-CROWNED SNAKE** (*Pseudelaps harriettae* Krefft). Venomous, but practically harmless.
Colour: Usually dark brown, with a large whitish blotch on the nape connected with the white sides of the head. Sometimes the head-markings are almost yellow. Scales on the sides of the neck are distinctly yellow-striped.
Scalation: S 15. V 176-193. SC 29-35 paired. A 2.
Southern Queensland.
17. **RED-NAPED SNAKE** (*Pseudelaps diadema* Schlegel). Venomous, but practically harmless.

Colour: Head and neck black, with a scarlet or orange heart on nape. Body brown above and yellowish below.

Scalation: Nasal not in contact with the preocular. S 15. V 165-255. SC 60-100 in pairs. - A 2.

General to Australia.



NAMES OF VARIOUS SCALES

R—Rostral
I—Internasal
N—Nasal
PO—Preocular
PF—Prefrontal
SO—Supraocular

T—Temporal
F—Frontal
P—Parietal
NU—Nuchals
V—Ventrals
SC—Subcaudals

A—Anal
CS—Chin Shields
UL—Upper Labials
LL—Lower Labials

18. **YELLOW-NAPED SNAKE** (*Pseudelaps cristatus* Fry). Venomous, but innocuous.

Colour: Light brown above, the head is dark brown, and there is a broad yellow collar on the nape. The lips are yellow and the underparts whitish.

Scalation: The nasal is not in contact with the preocular. S 17. V 165. SC about 38 pairs. A 2.
Northern Australia.

19. **MUELLER'S SNAKE** (*Pseudelaps muelleri* Schlegel). Venomous, but not dangerous.

Colour: Brown above with lighter vertebral line. Head brown, spotted with black markings. Light and dark brown and white markings with yellowish streaks on the side of the head. Underparts yellow to coral red, speckled with black.

Scalation: Nasal divided and in contact with the preocular. S 15. V 140-180, SC 21-35, in pairs. A 2.

20. **COLLARED BROWN SNAKE** (*Demansia nicholis* Gunther).
Venomous.
Colour: Usually a light tan with a dark brown blotch on the head and another on the nape. Some have pale brown cross-bands.
Scalation: Rostral deeper than broad. Frontal broader than the supraoculars. S 17-19-21. V 184-200. SC in 53-65 pairs. A 2.
S.W. Australia and some parts of the north.
21. **WESTERN BROWN SNAKE** (*Demansia modesta* Gunther). Venomous.
Colour: Usually pale olive brown, to reddish in the desert forms with a few widely separated dark cross-bands. There is a black mark on the head, separated by a yellow band from another on the nape. The underside is whitish.
Scalation: S 17. V 154-165. SC in 38-51 pairs. A 1.
Western Australia.
22. **SPOTTED-HEADED SNAKE** (*Demansia olivacea* Gray). Venomous.
Colour: Variable. May be olive, light or dark brown above, each scale having a darker edge. The head is speckled and lined with dark markings, and there is a yellowish streak from the eye to the angle of the mouth. The underparts are yellowish.
Scalation: Rostral broader than deep. Frontal narrower than the supraoculars. S 15. SC in 79-99 pairs. A 2.
Northern Australia.
23. **WILKIN'S BROWN SNAKE** (*Demansia guttata* Parker). Venomous.
Colour: Pale brown above; some of the scales with darker edges. There are about eleven dark blotches between the head and the tail, and two on the tail. The lower surfaces are whitish.
Scalation: Rostral broader than deep. Frontal broader than the supraocular. Nasal entire, just making contact with the preocular, the latter only slightly hollowed out. S 21. V about 207. SC in 56 pairs. A 2.
Single specimen collected near Winton (Q.).
24. **SPOTTED BROWN SNAKE** (*Demansia affinis* Gunther). Venomous.
Colour: From tan to a darker brown above with a few scattered spots on the head and along the back. The sides are lighter. The underparts yellowish, finely spotted with grey.
Scalation: Rostral broader than deep. Frontal broader than the supraoculars. S 17-19-21. V 184-220. SC 52-63 in pairs. A 2.
Central and S.W. Australia.
25. **CARINATED BROWN SNAKE** (*Demansia carinata* Longman). Venomous.
Colour: Dark to blackish-brown above, the head being darker than the body. There are alternate dark and light cross-bands on the dorsal surface, extending to the sides, with the dark band outlined by a much lighter one.
Scalation: Rostral deeper than broad. Frontal not much wider than the supraoculars. S 17. V 220. SC in 55 pairs. A 2.
Charleville district (Q.).
26. **INGRAM'S BROWN SNAKE** (*Demansia ingrami* Boulenger). Venomous.
Colour: Upper surface is dark brown, some of the scales having lighter centres. The underparts are yellowish, the outer edges of the scales being dark brown.

Scalation: S 17. V 205. SC 65, in pairs. A 2. Rostral broader than deep. Frontal as broad as the supraocular. Nasal does not join the preocular.

Single specimen from Northern Territory.

27. **YELLOW-FACED WHIP SNAKE** (*Demansia psammophis* Schlegel)
Venomous, but not deadly.

Colour: May be olive-brown to grey above; but the yellow marking round the eye is very distinctive.

Scalation: S 15. V 170-225. SC in 69-105 pairs. A 2.

General to Australia.

28. **YELLOW-FACED WHIP SNAKE**, var. (*Demansia psammophis*, var. *reticulata*). Venomous, but not deadly.

Colour: A greener variety than the Whip mentioned previously. Scales edged black.

Scalation: S 15. V 175-225. SC 63-79 pairs. A 2.

29. **COMMON BROWN SNAKE** (*Demansia textilis* Dumeril and Bibron). Venomous.

Colour: Variable. From light tan to almost a black. A good feature for identification is that the ventrals are always blotched. Young specimens are banded.

Scalation: S 17. V 190-220. SC in 46-70 pairs. The anal is divided. General to Australia.

30. **GREY-BELLIED SNAKE** (*Demansia textilis*, var. *inframacula* Waite). Venomous.

Colour: General colour of the back resembles that of No. 24. The underparts are heavily marked with grey.

Scalation: S 17. V 190. SC in 62 pairs. A 2.

Specimen found in South Australia.

31. **PERCY ISLAND SNAKE** (*Demansia torquata* Gray). Venomous, but not dangerous.

Colour: Olive to brown above, the head being darker than the body. There is a yellow patch on the side of the head, on the snout and behind the eye. A black bar runs from eye to eye and another from the eye to the angle of the mouth. A dark, yellow-edged collar. The underparts are greyish with a dark median streak.

Scalation: Frontal not so broad as the supraocular. S 15. V 191-203. SC in 75-81 pairs. A 2.

Coastal districts of N.E. Queensland.

32. **MARBLE-HEADED SNAKE** (*Demansia ornaticeps* Macleay). Venomous, but not deadly.

Colour: Slate-coloured to brown above, each scale tipped with a reddish colour. The head is beautifully marbled with white-edged, dark markings. There is also a conspicuous yellow marking along the side of the head and the neck.

Scalation: S 15. V 187. SC in 90 pairs. A 1.

North and Western Australia.

33. **ROUGH-SCALED SNAKE** (*Tropidechis carinatus* Krefft). Venomous.

Colour: Olive-green to brown above, with numerous cross-bands of a darker shade, some of which may be broken up on the median dorsal surface. The lips and underparts are yellowish-white.

Scalation: S 23 (the dorsal ones strongly keeled). V 165-171. SC 52-54, all single. The anal is entire.

Central eastern Australia.

34. **ARROW-NAPED SNAKE** (*Tropidechis dimensis* De Vis). Venomous, but not dangerous.
Colour: Light coppery-brown back crossed with thin darker bands. Arrow of darker brown at the nape, the dorsal median having an irregular line.
Scalation: The frontal much broader than the longer and narrow supraoculars. The nasal is in contact with the preocular. S 23. V 216. SC in 54 pairs. A 1.
 Single specimen found at Darra (Q.).
35. **KREEFT'S TIGER SNAKE** (*Notechis ater* Krefft). Venomous and deadly.
Colour: Very much like No. 37, to which it is related.
Scalation: UL 5. S 17. V 163. SC 47, single. A 1.
 Flinders Range, South Australia.
36. **TIGER SNAKE** (*Notechis scutatus* Peters). Venomous and deadly.
Colour: May vary from olive to rich brown or tan above. Yellowish white below. The dark cross-bands are about the same size as the interspaces.
Scalation: S 15, 17, 19. V 128-185. SC 30-61, all single. A 1.
37. **KANGAROO ISLAND BLACK SNAKE** (*Notechis scutatus*, var. *niger* Kinghorn). Venomous and deadly.
Colour: Back dark steel-blue. Ventral dark slate-grey. Some white scales on the neck.
Scalation: UL 6. S 19. V 184. SC 45, all single. A 1.
 Kangaroo Island, South Australia.
38. ? (*Rhinoplocephalus bicolor* Mueller). Venomous.
Colour: Above, greyish olive, the scales on the sides having dark edges. It is whitish beneath, and the tongue is described as being white.
Scalation: It has no internasal shields. There are two preoculars, the lower one joining the nasal shield. S 15. V 159 approx. SC 34, all single. The anal is single (A-1).
 Western Australia.
39. **DEATH ADDER** (*Acanthophis antarecticus* Shaw). Venomous and deadly.
Colour: General colour brown or grey with dark cross-bands.
Scalation: S 21-23. V 113-130. SC 41-51, the 5-27 last paired. A 1.
 General to Australia.
40. **DESERT DEATH ADDER** (*Acanthophis pyrrhus* Boulenger). Venomous and deadly.
Colour: Usually light tan with darker cross-bands.
Scalation: S 21. V 146. SC 50, the last 29 divided. A 1.
 Central Australia.
41. **LITTLE DESERT SNAKE** (*Elapognathus minor* Gunther). Venomous, but innocuous.
Colour: Olive-brown above, and olive to greyish beneath, the edges of the ventrals being brownish. In the young a black patch may be present on the nape.
Scalation: Frontal broader than the supraocular. Nasal entire and in contact with the preocular. Scales finely striated. S 15. SC 52-60, all single. A 1.
 South-western Australia.
42. **AUSTRALIAN CORAL SNAKE** (*Rhynchoelaps australis* Krefft). Venomous, but harmless.

Colour: Red, with cross-bands formed by yellow, black-edged scales.
Scalation: The rostral shield extends, in a point, well back on to the head. The prefrontals are obliquely set. S 17. V 152-163. SC 18-20, in pairs. A 2.
Eastern Australia.

43. HALF-GIRDLED SNAKE (*Rhynchoelaps semifuscatus* Gunther).
Venomous, but harmless.

Colour: Yellowish, with a brown bar on the head, and narrow bands on the head. Narrow bands on the body which do not extend far down the sides.

Scalation: Scales on the snout are obliquely set, and the frontal is three times as broad as the supraocular. S 17. V 143-170. SC 17-25. A 2.
Western Australia.

44. DESERT BANDED SNAKE (*Rhynchoelaps bertholdi* Jan). Venomous, but harmless.

Colour: Yellowish with dark cross-bars. The head finely spotted with brown, especially the hinder part.

Scalation: S 15. V 112-126. SC in 15-25 pairs. A 2.
Southern and south-western Australia.

45. (*Rhynchoelaps fasciolatus* Gunther). Venomous, but harmless.

Colour: Reddish above, with a large black mark on the nape and the head, becoming broken up on the body, the bands there being formed by black spots.

Scalation: Frontal three times as broad as the supraoculars. The nasal widely separated from the preocular. S 17. V 145-161. SC 22-27, in pairs. A 2.
South-western Australia.

46. QUEENSLAND GIRDLED SNAKE (*Rhynchoelaps fuscicollis* Lonnberg and Anderson). Venomous.

Colour: Reddish-brown, the edges of the scales being darker, producing a reticulate pattern. There is a blackish blotch six scales wide on the nape.

Scalation: S 15. Four temporal scales. V 143. SC 20, all in pairs. A 2.
Northern Queensland.

47. SMALL-SCALED PSEUDECHIS (*Pseudechis microleptodus* McCoy). Venomous.

Colour: Dark brown. The under surface yellowish. The ventral shields edged with grey.

Scalation: Nasal not in contact with the preocular. The frontal is 14 times as long as broad, and broader than the supraoculars. S 23. V 230-237. SC 61-66, all in pairs. A 1.
Riverina.

48. MULGA SNAKE (*Pseudechis australis* Boulenger). Venomous.

Colour: Coppery-brown to light brown, the under parts being yellowish.

Scalation: The rostral is broader than deep. The internasals half as long as the prefrontals. The frontal is about as broad as the supraocular, and as much as twice as long as broad. S 17. V 199-220. SC 57-70, anterior half single. A 2.
South-western New South Wales.

49. COPPER SNAKE (*Pseudechis cupreus* Gray). Venomous.

Colour: Tan to reddish-brown.

Scalation: Frontal twice as long as broad and narrower than the supraoculars. The nasal joins the preocular. S 17. V 199-220. SC 57-70, the majority of the anterior ones single, the rest in pairs. A 2.

Murray River country of Victoria and New South Wales.

50. WEST AUSTRALIAN COPPER SNAKE (*Pseudechis denisonoides* Werner). Venomous.

Colour: Upper scales coppery-brown; the bases of the scales are golden. The under parts are yellowish.

Scalation: The internasals are only about one-third as long as the prefrontals. The frontal is nearly twice as long as wide, and not as broad as the supraoculars. S 17. V 189. SC 34 single. the rest in pairs. A 1.

South-western Australia.

51. RED-BELLIED BLACK SNAKE (*Pseudechis porphyriacus* Shaw). Venomous.

Colour: Black above, the ventral shields being salmon-coloured in the centre and red at the side.

Scalation: S 17. V 180-210. SC 50-60, the first 5-20 single. A 2. Eastern Australia.

52. BLUE-BELLIED BLACK SNAKE (*Pseudechis mortoniensis* De Vis). Venomous.

Colour: Bluish-black above, and bluish-grey below.

Scalation: The frontal is not much longer than broad, and only a little wider than the supraoculars. The posterior nasal reaches the preocular. S 19. V 191-193. SC 59-61, the first 22-40 being single. A 1.

Northern and eastern Queensland.

53. PORT DARWIN BROWN SNAKE (*Pseudechis darwiniensis* Macleay). Venomous.

Colour: The head is a pale brown; the body is reddish-brown above, the scales being dark-edged; the belly is creamy-white.

Scalation: The frontal shield is as broad as long and much wider than the supraoculars. S 17. V 212. SC 54-64, the anterior ones being single, the remainder in pairs. A 2.

Northern Australia.

54. SPOTTED BLACK SNAKE (*Pseudechis guttatus* De Vis). Venomous.

Colour: Generally dark olive-brown above. Many of the anterior scales have a single yellow spot. The head is uniform brown, and the ventrals slate-grey with light markings.

Scalation: The frontal shield is smaller than the prefrontals and about as wide as the supraoculars. The nasal is divided and in contact with the preocular. S 19. V 181-193. SC 52-59, mostly single. A 2.

The plains of southern Queensland.

55. WHITE-BELLIED BLACK SNAKE (*Pseudechis ferax* Macleay). Venomous.

Colour: Glossy black above and yellowish-white beneath.

Scalation: The frontal is longer than broad; the preocular is deeply grooved; and the nasal does not reach the preocular. S 23. V 235. SC 60, all in two rows. A 2.

Western New South Wales.

56. ? (*Pseudechis colletti* Boulenger). Venomous.
Colour: A rich dark tan above, crossed by many irregular, blackish, narrow bands, and a short longitudinal one on the neck.
Scalation: The frontal is very small, much smaller than the prefrontals, and smaller than the supraoculars. S 19. V 223. SC 60, the last 9 in pairs. A 2.
 Queensland.
57. ? (*Pseudechis scutellatus* Peters).
Colour: Tan above and yellowish-white below; some of the ventral plates blotched with dark brown.
Scalation: S 23. V 221-224. SC 49-55, the first 26-27 single, the rest in pairs. A 2.
 Central Queensland.
58. GIANT BROWN SNAKE (*Oxyuranus macleayensis* Kiehn).
 Venomous and deadly.
Colour: Coppery-brown above, yellowish below, some of the abdominal scales blotched with grey.
Scalation: S 21. V 234. SC 67 pairs. A 1.
 Northern and north-eastern Australia.
59. ORNAMENTED SNAKE (*Denisonia maculata* Steindachner). Venomous, but not dangerous.
Colour: The back is dark reddish-brown above, the head lighter and mottled with yellow.
Scalation: The frontal shield is $1\frac{1}{2}$ times as long as broad, broader than the supraoculars. The nasal is divided and in contact with the preocular. S 17. V about 130. SC 24, all single. A 1.
 Southern and central Queensland and northern New South Wales.
60. ? (*Denisonia maculata*, var. *devisii* Waite and Longman). Venomous, but not dangerous.
Colour: Yellowish-brown back with blackish, irregular cross-bands. The head is dark spotted and the under surfaces whitish.
Scalation: S 17. V 124-140. SC 25-37, single. A 1.
 Inland Queensland and New South Wales.
61. ? (*Denisonia maculata*, var. *fasciata* Rosen). Venomous, but not dangerous.
Colour: Much the same as the Ornamented Snake.
Scalation: The rostral is broader than deep, the frontal much broader than the supraoculars. The nasal is not divided, and joins the preocular. S 17. V 153-165. SC 28-31, single. A 1.
 South-western Australia.
62. WHITE-LIPPED SNAKE (*Denisonia coronoides* Gunther). Venomous, but not dangerous.
Colour: Varies from brownish to olive above, the belly scales cream to salmon-pink, the upper lip white below a black line.
Scalation: The frontal shield is usually twice, but nearly three times sometimes, as long as broad, and not much broader than the supraoculars. Scales distinctly striated. S 15. V 136-151. SC 39-57, all single. The anal is entire.
 General to Australia.
63. WHITE-LIPPED SNAKE, var. (*Denisonia coronoides*, var. *marstoni* Krefft). Venomous, but not dangerous.
Colour: Olive to brown above, creamy-white on the under parts. There is a black streak from the nostril through the eye, but the upper lip is not usually white. The most striking feature is the yellow collar.

Scalation: The head shields are similar to those of No. 62. S 15, V 136-151. SC 39-57, single. A 1.
General to Australia.

64. **CORONATED SNAKE** (*Denisonia coronata* Schlögel). Venomous, but not dangerous.

Colour: Somewhat like No. 63, but may be easily distinguished by the black collar.

Scalation: The frontal shield is one and a half times to twice as long as broad, and not much broader than the supraocular. S 15, V 138-151. SC 26-50, all single. A 1.
General to Australia.

65. **BLACK-BELLIED SNAKE** (*Denisonia signata* Jan). Venomous, but not dangerous.

Colour: The under parts are coloured very dark grey or black. The upper parts are dark olive-brown, with, usually, a yellowish stripe behind the eye; a yellowish streak may also be present on the upper lip.

Scalation: The frontal may be nearly twice as long as broad and broader than the supraocular. S 17. V 150-170. SC 41-56, all single. A 2.
Eastern Australia.

66. **BLACK-BELLIED SNAKE**, var. (*Denisonia signata*, var. *vagrans* Garman). Venomous, but practically harmless.

Colour: A uniform olive above, the belly olivaceous, but the throat nearly black. The under-tail scales are light. There is a black streak from the nostril through the eye to the angle of the mouth.

Scalation: The frontal is twice as long as broad, and half as wide again as the supraoculars. The nasal is single and in contact with the preocular. S 17. V 161. SC 49, all single. A 2.
Only known from Dunk Island, Queensland.

67. **SUPERB SNAKE** (*Denisonia superba* Günther). Venomous and deadly.

Colour: Varies from black to brown, the centre of the scales being lighter. Some specimens have a dark nuchal collar, with a yellow border, and a dark vertebral stripe. The scales joining the ventrals are large, and are either a yellow, or salmon with dark tips.

Scalation: The frontal is one and three-quarter times to twice as long as broad, and as broad as, or narrower than, the supraocular. Rostral broader than deep. S 15, rarely 13. V 145-160. SC 41-50, single. A 1.
Eastern Australia—a mountain form.

68. (*Denisonia nigrescens* Günther). Venomous, but not dangerous.

Colour: A uniform dark olive to black on the upper parts, the lower parts yellowish; the scales have dark edges.

Scalation: The rostral is twice as broad as deep; the frontal about one and a half times as long as broad and quite twice as broad as the supraoculars, which are very short. The nasal is single and joins the preocular. S 15. V 170-200. SC 30-40, all single. A 1.
Queensland and New South Wales, particularly the coastal areas.

69. **CARPENTARIA WHIP SNAKE** (*Denisonia carpentariae* Macleay). Venomous, but regarded as harmless.

Colour: May be a sandy or tan colour, sometimes with a tinge of olive. The upper lip and the lowermost row of scales are yellow.

Scalation: The internasals are half as large as the prefrontals. The

frontal is not much longer than broad, and is twice as broad as the supraoculars. The nasal does not join the preocular. S 15. V 166-183. SC 31-43, single. A 1.

70. ? (*Denisonia daemelin* Günther). Venomous, but harmless.

Colour: Brownish to olive above, yellowish-white beneath. There is a dark band on the nape. In the young the head may be black.

Scalation: The rostral is twice as broad as deep, and the internasals are not half as large as the prefrontals. The frontal and the supraoculars are elongate, the former being nearly twice as broad as the latter. The nasal is in contact with the preocular. S 17. V 147-168. SC 40, all single. A 2.
Central west Queensland.

71. BLACK-STRIPED SNAKE (*Denisonia nigrostriata* Krefft). Venomous, but not deadly.

Colour: Back, several shades of light brown, with a very distinct almost black line down the centre of the back. The upper lip and lower parts are yellowish.

Scalation: The internasals are not half as long as the prefrontals; the frontal is very broad, quite twice as broad as the supraoculars. S 15. V 180-184. SC 50-64, all single. A 1.
Eastern Queensland and New South Wales.

72. BLACK-HEADED SNAKE (*Denisonia gouldii* Gray). Venomous, but not dangerous.

Colour: May be coppery-brown to a light olive-brown above, and creamy white below. The upper part of the head may be shiny-black, or with a white patch on the side of the snout.

Scalation: The internasals are nearly as long as the prefrontals; the frontal is not much longer than broad, and is quite twice as broad as the supraocular. The nasal joins the preocular. S 15. V 140-170. SC 25-30, single. A 1.
Australia generally.

73. ? (*Denisonia pallidiceps* Günther). Venomous.

Colour: The back is dark olive-brown, but the head is much lighter. The under surface is yellowish with a dark central line under the tail.

Scalation: The frontal is about one and a half times as long as broad, and twice as broad as the supraoculars. The nasal is divided. S 15. V 170-180. SC 37-38, single. A 1.
Northern and north-eastern Queensland.

74. ? (*Denisonia ramsayi* Krefft). Venomous, but harmless.

Colour: Dark olive-green to brown above, each scale tipped with reddish, and there is a dark line down the centre of the back. The under parts are yellowish, marked with brown, as also are the lip scales; the tail is black underneath.

Scalation: Frontal twice as long as broad, and as wide as the supraoculars. Nasal does not reach the preocular. S 15. V 164. SC 51, all single. A 2.
Southern highlands of New South Wales.

75. ? (*Denisonia muelleri* Fischer). Venomous, but harmless.

Colour: Usually greyish above, washed with brown. The upper and lower lips, and sides of neck, are spotted with yellow. The under surface is grey with several longitudinal rows of dark spots.

Scalation: The nasal joins the preocular. The frontal is about twice as long as broad, and not much broader than the supraoculars. S 17. V about 118. SC 38, all single. A 1.
Northern half of Queensland.

76. **LITTLE WHIP SNAKE** (*Denisonia flagellum* McCoy). Venomous, but harmless.
Colour: Brown above; the head is very dark, with a white band across the snout. Each scale is dark at the base.
Scalation: The frontal shield is one and a half times as long as broad, and much broader than the supraocular. The nasal is entire, and in contact with the preocular. S 17. V 130-138. SC 25-27, all single. A 1.
 Southern Victoria.
77. : (*Denisonia punctata* Boulenger). Venomous, but harmless.
Colour: Usually pale brown above, each scale with a brown spot. The head is orange with blackish blotches, and a black streak on each side of the head from the snout. The lower parts are yellowish-white.
Scalation: The frontal is nearly twice as long as broad, and twice as broad as the supraocular. The nasal is entire and joins the preocular. S 15. V about 160. SC 25, all single. A 1.
 North-western Australia.
78. : (*Denisonia sula* Peters). Venomous, but not dangerous.
Colour: Light or darker brown above, with a broad dark brown band on the nape. The labials, nostril and a patch over the eyes, yellow; and a black stripe on the side of the head.
Scalation: The frontal may be twice as long as broad, and twice as broad as the supraocular. The nasal may or may not join the preocular. S 19. V 154-164. SC 25-30, single. A 1.
 East-central Australia.
79. **PALE-HEADED SNAKE** (*Hoplocephalus bitorquatus* Jan). Venomous, but not deadly.
Colour: A white and a brown or grey patch on the nape. Body olive-brown above, and greyish below. The top of the head is greyish and may bear black markings. It sometimes has a white or yellow spot on the side of the head near the neck.
Scalation: Frontal much broader than the supraoculars. S 21. V 197-220, angulate. SC 44-60, all single. A 1.
 Queensland and New South Wales.
80. **YELLOW-BANDED SNAKE** (*Hoplocephalus stephensi* Krefft). Venomous.
Colour: Yellow, with black cross-bands and irregular markings.
Scalation: Frontal one and a half times as long as broad, and quite twice as broad as the supraoculars. The internasals are much smaller than the prefrontals. S 21. V strongly angulate. SC 60, all single. A 1.
 North coast of New South Wales.
81. **BROAD-HEADED SNAKE** (*Hoplocephalus bungaroides* Boie). Venomous.
Colour: Blackish above, with yellow spots forming a lattice-work of cross-bars; or the spots may be broken up on the dorsal surface.
Scalation: The nasal may be entire or divided, usually the latter. S 21. V 214-221, strongly angulate. SC 40-56, all single. A 1.
 Coastal areas and ranges of northern New South Wales.
82. **DESERT SNAKE** (*Brachyaspis curta* Schlegel). Venomous.
Colour: Dorsal olive-brown above, to almost a reddish-brown. Creamy white below.
Scalation: The frontal may be twice as long as broad. S 19. V 128-138, rounded. SC 30-35, all single. A 1.
 Inland areas of Western Australia.

83. (*Furina bimaculata* Dumeril and Bibron). Venomous, but practically harmless.
Colour: Yellowish above, each scale being edged with brown. There is a large dark brown patch on the head, and another on the neck.
Scalation: The frontal is shield-shaped, nearly as broad as long, and three times as broad as the supraoculars. There are five upper labials. S 15. V 181-217, rounded. SC 29-30, all paired. A 2. Western Australia.
84. BANDY BANDY (*Furina annulata* Dumeril and Bibron). Venomous, but inoffensive.
Colour: Banded alternately with black and white rings.
Scalation: The frontal is about one and a half times as long as broad, and about twice as broad as the supraoculars. S 15. V 180-234. SC 14-25, paired. A 2.
85. MANY-RINGED SNAKE (*Furina multifasciata* Longman). Venomous, but harmless.
Colour: Upper surface banded alternately with dark brown and white bands. Under surface irregularly spotted with black on a white ground.
Scalation: No internasal shields. Frontal a little longer than broad, and quite three times as wide as the small supraoculars. S 15. V 284. SC 20, all in pairs. A 2. Northern and eastern Australia.
86. (*Furina calonota* Dumeril and Bibron). Venomous, but harmless.
Colour: The body is yellowish-brown above, with a dark brown vertebral stripe, each scale of the stripe having a dark spot. There is a black bar on the snout, and another on the frontal. The occiput is brown, and there is a dark band on the neck.
Scalation: The frontal is a little longer than broad, and three times as broad as the supraoculars. The nasal joins the preocular. There are six upper labials. S 15. V 126-130, rounded. SC 30, in two rows. A 2. South-western Australia.

FOOD OF FAN-TAILED CUCKOO

In the *Pict. Nat.*, November, 1947, p. 145, appeared a note on a male Fan-tailed Cuckoo (*Coccyzus flabelliformis*) that had destroyed itself against a glass window at Maribyrnong. Regarding the caterpillars mentioned as having been found in the stomach of the dead bird, a report has since been received from the Director of the National Museum, Melbourne. In this report, the Museum Entomologist (Mr. A. W. Burns) states:

"Examination shows remains of Lepidopterous larvae in various stages of disintegration. Of the fragments, the chitinous head capsules still remain intact: these are the same as those attached to the several fairly intact specimens which are undoubtedly larvae of an Anthelid moth. From the colour of the body hair tufts I should say that the species is *Anthela denticulata*. These caterpillars are grass feeders and at times are very numerous."

In the same note, the remarks on a pair of Black Swans at Queen's Park lake, Moonee Ponds, contain a typographical error. The particular sentence is now corrected to read: "Last year they raised two broods which were ~~unsuccessfully~~ (not 'successfully') driven away."

H. C. E. STEWART

WHAT, WHERE AND WHEN

General Excursions:

Saturday, Dec. 6—Evening Walk, Yarra Boulevard at Studley Park. Subject: "Astronomy and General." Leader: Mr. E. E. Lord. Meet 7.30 p.m., Johnston St. Bridge (Abbotsford, Kew). If possible please bring telescopes, binoculars and good torch.

Saturday, Dec. 13—Kinglake. Subject: "National Park Survey." Leader: Mr. A. A. Branton. Nash's bus leaves Batman Avenue 9 a.m. Bookings 5/6 return with Mr. R. D. Lee, 18 Normanby St., Brighton, S.5. Bring two meals.

Sunday, Dec. 21—Lower Fern Tree Gully. Subject: "Entomology." Leaders: Messrs. R. A. Green and F. Hallgarten. Train leaves Flinders St. at 9.48 a.m. Fare, 2/9 second class return. Bring one meal.

Special Notice:

Jan. 24-26 week-end.—It is proposed to arrange a camp-out for limited party at Lake Mountain, via Marysville. Subject "Alpine Botany and General." Members able to provide own transport and camp equipment please contact leader, Mr. J. Ros Garnet, 270 Albion St., West Brunswick, N. 12.

Group Fixtures:

Friday, Dec. 5—Marine Biology Group. Royal Society's Hall, 8 p.m. Further particulars from Hon. Sec. of Group, Miss W. Taylor, 13 Jolimont Square, Jolimont, C.2. [No Group meeting will be held on the first Friday in January, 1948.]

Saturday, Dec. 6—Geology Group. Further particulars from Hon. Sec. of Group, Mr. A. A. Baker.

Sunday, Dec. 14—Marine Biology Group excursion to Canadian Bay, Frankston. Leader: Mrs. J. J. Freame. Train leaves Flinders St. at 8.53 a.m. (fare 2/7), connecting 10 a.m. bus to Mt. Eliza Store (8d. single). Return bus 5.30 and 6.10 p.m. Bring two meals.

Saturday, Dec. 20—Botany Group excursion to Beaconsfield. Train leaves Flinders St. at 7.40 a.m. Bring two meals.

Monday, Dec. 22—Botany Group. Royal Society's Hall, 8 p.m. Subject: "Victorian Plant Associations," by Mr. J. H. Willis, B.Sc.

Tuesday, Feb. 3—Geology Group. Royal Society's Hall, 8 p.m. (First meeting for the New Year). Subject: "Palaeontology, Part I—Botany," by Mr. F. S. Colliver.

A. A. BAKER,

Excursion Secretary,

53 Carlisle Street, Preston, N.18.

EXCURSION TO BEACONSFIELD

Although the dozen members who visited Beaconsfield, under Mr. A. S. Chalk's leadership, on October 11 were unable to find any trace of the endemic Helmeted Honeyeater, principal objective of this outing, they were amply rewarded by excellent glimpses of several interesting birds. The shy and uncommon Blue-billed Duck (*Oxyura australis*) was seen, and the Australian Ground-Thrush (*Oreocincla lunulata*) was observed on her nest with three fawn eggs; the aptness of the specific name was appreciated at close quarters, by examination of the dark "half-moons" edging her breast feathers. Many nests, with eggs or young, were found during the day.

DAWN WESTON,

The Victorian Naturalist

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No. 769

PROCEEDINGS

The monthly meeting of the Club was held at the Lecture Hall of the Public Library on December 8, 1947, the President (Miss Ina Watson) and about 180 members and friends attending.

A welcome to all visitors was extended, and special mention was made of Mr. Noel Lothian being present. Mr. Lothian, recently of Christchurch, N.Z., takes up his new position as Director of the Botanic Gardens, Adelaide, early in the New Year.

The following were elected as Ordinary Members of the Club: Mrs. N. D. Hellisen, Misses H. Brown and M. Aliender, Messrs. R. C. Seeger and W. S. Nicholls; and as Country Member, Mr. John Bechervaise.

Mr. V. H. Miller brought under notice a report that certain country districts were purchasing eggs and heads of sparrows, and he asked was any check being made to see that native species of birds were not being destroyed as well. The matter was referred to the Committee for investigation.

A newspaper cutting relating to a recent prosecution (one month imprisonment without the option of a fine) for having possession of *Thryptomene* taken from Crown land in the Graupians area was read and commented upon.

Prof. O. W. Tiegs gave an illustrated lecture on the subject of "The Metamorphosis of Insects." He traced partial and complete changes in various groups of insects and explained just how these took place in some of the higher orders.

An interesting discussion followed, many questions being asked by members and answered by Professor Tiegs.

A vote of thanks to the lecturer was moved by Mr. J. H. Willis, seconded by Mr. A. H. Chisholm, and carried by acclamation.

EXHIBITS

Mr. J. S. Seaton: *Lambertia formosa*, garden-grown at Caulfield.

Mrs. C. H. Edmondson: *Kunzea peduncularis* and *Leptospermum myrsinoides*, garden-grown.

Mr. A. N. Carter. South African limpets, including *Patella rustica* Linn., *P. variabilis* Krauss, *P. granularis* Linn., *P. compressa* Linn., and *P. longicostata* Lam.

Mr. T. S. Hart: All the Victorian *Dianellas* (Flax-lilies), the Giant Mountain-grass and Elderberry *Panax* (two forms).

THE METAMORPHOSIS OF INSECTS

(Summary of address by Professor O. W. Tiegs, delivered to the F.N.C. on December 8, 1947)

If we survey the different orders of insects with respect to their life-histories, we at once see that metamorphosis is not one of the general characteristics; and, moreover, as we pass from the less to the more specialized types so do we find a progressive increase in the degree of metamorphosis.

In the silver-fish there is no metamorphosis, the young insect leaving the egg in a condition which differs only in size from that of the adult. This applies also to the wingless forms of Orthoptera. But in winged Orthoptera, as in winged termites, the young insect (nymph) differs from the adult in the absence of wings, the wing-buds enlarging at successive moults, the completed wing however appearing only after the last moult. This is the case also in most hemipterous insects, so that, properly speaking, they cannot be said to undergo any metamorphosis. Entomologists, who are concerned chiefly with the external features of insects, have always been impressed with the abrupt changes that occur at successive moults, and have accordingly designated this type of insect as hemimetabolic, in contrast to the holometabolic type in which a true metamorphosis is involved.

It is in the dragon-fly that an incipient metamorphosis first occurs, for the adult insect differs very markedly both in appearance and in habits from the nymph. The internal changes that attend the metamorphosis have never been adequately examined. It is in the scorpion flies and Neuroptera that we first find a true metamorphosis; the larva now differs very markedly from the adult insect (imago), and the transformation can only be achieved by the destruction of much of the larval tissue, so that a quiescent resting stage is inserted in the life-history. We call it the pupa. As we pass into the higher orders of insects, we find a progressively greater divergence between the external form of the larva and of the imago, necessitating a more and more profound metamorphosis. The most noteworthy feature of the evolution of the larva is that the larva leaves the egg in an earlier and earlier stage of development as the higher orders of insects are reached. Thus in the beetles the larva may have long active legs, or short legs, or may, in some families, be devoid of legs. In the lepidoptera the caterpillar even has abdominal legs, like an insect embryo, this condition being reminiscent of the polypodous condition found in the myriapod ancestors of insects. In the larvae of flies (maggots) the larva leaves the egg even before its legs have formed. This applies also to the bees and wasps. Finally in some parasitic wasps we have the remarkable protopod larvae, in which even the segmentation in the abdomen has not yet appeared.

It was Weismann who first showed, in 1864, the real character of metamorphosis. The tissues of the imago developed out of "imaginal nests," nests or patches of embryonic cells that lay dormant among the larval cells while the latter grew and multiplied during the larval phase. The truly larval tissues, according to Weismann, disintegrated into "spheres of granules," which dissolved in the blood, and supplied the nutriment of the developing imaginal cells. Soon after this Metchnikoff made his great discovery of phagocytosis, i.e., the ability of certain wandering cells to devour invading organisms in the tissues of animals. It immediately became evident that the "spheres of granules" were gorged blood corpuscles (leucocytes), which were removing the larval tissues. This process of destruction of larval tissues, which attends the metamorphosis of all the higher insects, is called 'histolysis'. The histological changes that take place in the lower orders of insects, such as Neuroptera, during metamorphosis are unknown.

In recent years, owing to the work of Fraenkel, Wigglesworth and others, it has been possible to show that moulting and metamorphosis are stimulated by hormones liberated from, or near, the brain. The moulting hormone comes from large neurosecretory cells in the brain, and the transfusion of the blood of a *Rhodnius* nymph about to moult can induce moulting in another nymph. The corpora allata, situated near the brain, control metamorphosis. It is their active secretion that suppresses the development of adult characters, so that metamorphosis is ultimately due to the cessation of functioning of this hormone. The truth of this can be shown by removing the corpora allata from a young caterpillar, for upon moulting such a caterpillar proceeds to pupate and to imitate the formation of a diminutive imago.

HELMETED HONEYEATER

In case the impression is given that this bird, which is found only in a few isolated places in Victoria and nowhere else, has left the Cardinia Creek area (report Beaconsfield Excursion, *Vic. Nat.*, Dec., 1947, p. 168), it should be recorded that an outing of the R.A.O.U. six weeks later recorded approximately 50 birds on the creek.

The centre of their activity was about the junction of the Stony and Cardinia Creeks, some two miles upstream from the area explored by the F.N.C.V. excursion in September. There had been heavy rain for the week previous to the latter, and the creek was too flooded to allow of investigation higher up.

It would seem from recent excursions that the birds have abandoned the area of creek adjacent to the usual stopping-place, the "Store" above the golf links.

J.M.W.

ADDITIONS TO THE ORCHIDACEAE OF WESTERN AUSTRALIA—II.

Three New Species of the Genus *Prasophyllum* R.Br.

By. W. H. NICHOLLS, Melbourne.

I. *PRASOPHYLLUM PALUDOSUM*, sp. nov.

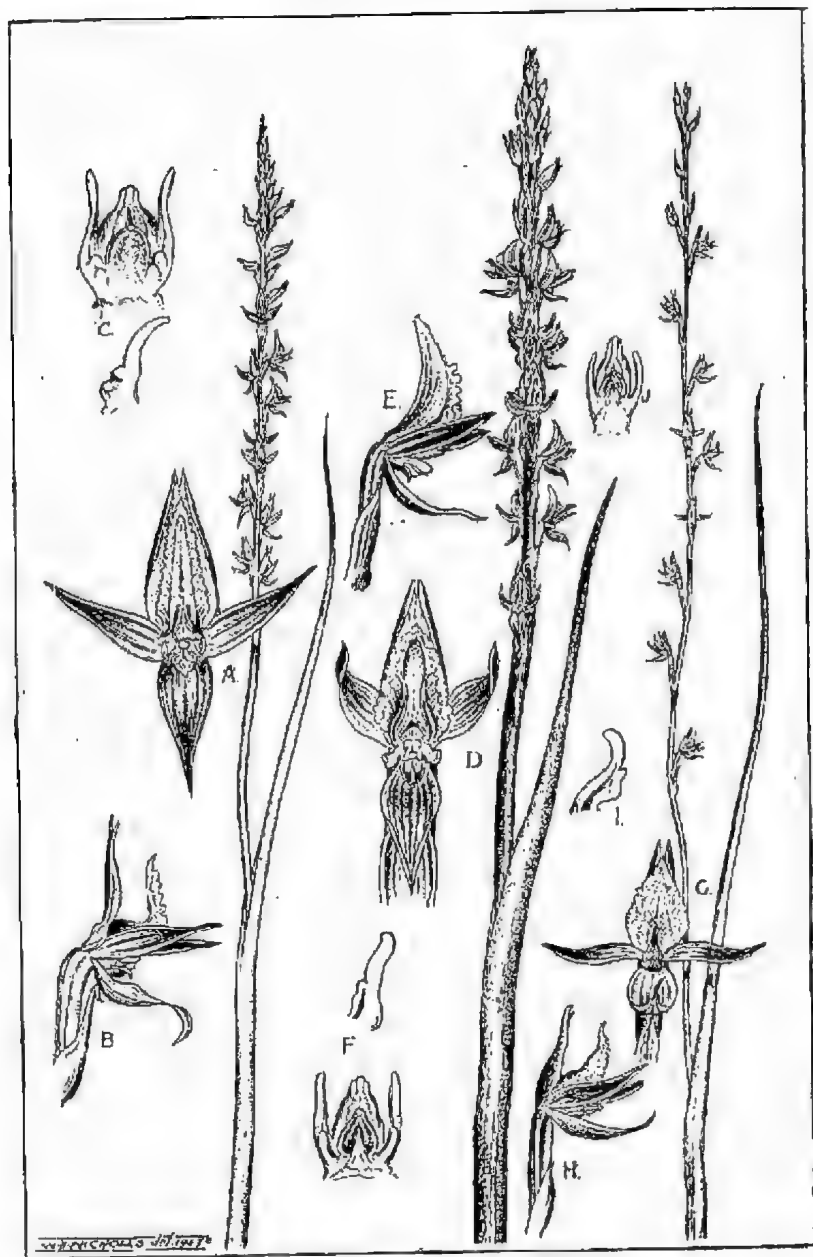
Planta gracillima vel subrobusta, 40-60 cm. alta. Foliium spica non-excedens. Flores subtaxi, sessiles, lutei vel virides et rubri. Sepalum dorsale lanceolatum, recurvum, acuminatum, circiter 7-8 mm. longum. Sepala lateralia inferne ultra medium connata, apicibus liberis. Petala erecta, patentia, lanceolata, sepalis angustiora et breviora. Labellum breviter unguiculatum in ambitu anguste-lanceolatum, margines incurvi in dimidio infero integri; pars membranacea pallida, ample crispata; pars callosa conspicua, viridis, non-elevata, prope apicem terminans. Columna robusta, brevissima; laciniae laterales, lineare falcatae, circiter 5 mm. altae, basi bilobulatae. Anthera badia apiculata, apice recurva; rostellum breviores. Caudicula brevis.

A slender or moderately robust plant from about 40 to 60 cm. high. Leaf-lamina not exceeding the inflorescence. Flowers fragrant, not crowded, wholly pale yellowish or greenish-yellow with pale red or purplish markings. Ovary long and slender, 7-8 mm. long, sessile or almost so. Dorsal sepal lanceolate, usually with a recurved acuminate apex, about 7-8 mm. long. Lateral sepals connate almost to the apex, occasionally quite free, about same length as dorsal one, margins incurved. Petals narrow-lanceolate, erect, widely dilated, shorter and narrower than the sepals. Labellum on a short basal spur (or claw) of the column, narrow-lanceolate, abruptly reflexed about the middle in mature flowers, about same length as sepals; membranous part narrow, very pale in colour (creamy-white), much crisped. Margins incurved; callous part green, the margins free only towards the base, hardly raised beyond the bend. Margins entire throughout, the plate narrowing gradually and continuing almost to the extreme apex, deeply channelled below. Column stout, lateral appendages about 5 mm. high, extending well above the rostellum, linear-falcate, with a large double lobe at the base. Anther ovate with a recurved apex, much shorter than the rostellum. Pollinia attached by a short caudicle to a prominent disk.

Flowering September-October.

Distribution (W.A.): Bayswater (HOLO- and PARATYPES), Welshpool, Upper King River, Busselton; *leg.*—W. H. Nicholls, 1946.

It is somewhat surprising that this comparatively large *Prasophyllum* should have remained undescribed until now, since the writer found it in two localities very close to Perth, viz., Bayswater



New Species of *Prasophyllum*. (For key see page 176.)

and Welshpool. At the former place it grew in association with numerous specimens of *Diuris emarginata* R.Br., and in the latter with abundant plants of *Epiblema grandiflorum* R.Br. Near Busselton (in the far south-west of the State) it was plentiful in Melaleuca country, where the location was discovered by chance, through the agency of this orchid's powerful fragrance.

Pr. paludosum is a frequenter of reedy swamps and boggy places. Near Perth it grows luxuriantly in 6-8 inches of water. *Pr. gracile* Rogers appears to be the closest ally, but the differences separating these species are at once apparent upon examination of the flower details, the new one having remarkably long sharp column appendages.

II. *PRASOPHYLLUM GRIMWADEANUM* sp. nov.

Planta robusta viride-aer eas, usque ad 65 cm. alta. Folium spicam usitate non-exceedens. Spica circiter 18-24 cm. longa. Flores subsessiles, numerosi conferti diversicolorati. Ovaria gracilia. Bractea lanceolata, acuta, appressa. Sepalum dorsale lanceolatum, acuminatum, incurvum vel recurvum, circiter 12 mm. longum. Sepala lateralia in media connata, anguste-lanceolata, falcata, recurva, circiter 14 mm. longa. Petala linearia vel anguste-lanceolata, erecta, incurva, circiter 10 mm. longa. Labellum per breviter unguiculatum, lanceolatum ad apicem gradatum recurvum; pars membranacea lata crispata; lamella adnata tenuis lataque, marginibus lateralibus liberis, ultro flexum in angustiusculo obtuso cacumine terminans. Columnae laciniae obtuse angulatae, rostellum longiores, basi lobulatae. Anthera apiculata, rostellum brevior.

A robust greenish-bronze plant up to 65 cm. high. Leaf-lamina variable, about 18 cm. long. Flowers in a somewhat crowded spike of about 18-24 cm. with about 40-60 flowers, which are brightly coloured (yellow, green, crimson, purple, mauve, etc., merging in a delightful colour scheme). Ovaries slender on very short pedicels, the subtending bracts lanceolate, acute. Dorsal sepal lanceolate, acuminate, incurved, the apex sometimes recurved, about 12 mm. long. Lateral sepals connate except at the extremities, narrow-lanceolate, falcate-recurved, longer than the dorsal one. Petals linear or narrow-lanceolate, erect, incurved, about 10 mm. long. Labellum on a very short claw, as long as the dorsal sepal, not abruptly reflexed; membranous portion wide, voluminous, crisped, pale dull-mauve in colour, inner plate with a wide deeply-channelled base, the margins elevated, free and entire, and contracting at the bend into a slightly raised, rounded green section, oblong in shape, terminating some distance from the apex. Column stout, about 3 mm. high, the appendages linear, apices angular, higher than the rostellum, a small lobe situated at the base of each wing. Anther dark red-brown, shorter than the rostellum, apiculate. Caudicle short.

Flowering September-October.

Distribution (W.A.): Sand ridges in very heavy scrub at Middleton's Beach, near Albany (HOLO-TYPE)—leg. W. H. Nicholls, Oct., 1946.

This species, the most gaily-coloured of all the *Prasophyllum*s, was found growing in thick scrub on the lee side of sand dunes adjacent to the beach. It was discovered when the writer penetrated the scrub (hereabouts attaining a height of over 15 feet) while endeavouring to regain the open beach. Only six specimens were seen and two only were in perfect condition, the remainder being well past their prime with only the uppermost flowers expanded.

I have named this attractively-coloured species in honour of Mr. W. Russell Grimwade of Melbourne; his keen interest and ready help have very considerably advanced the study of Australian orchids, and the writer owes a debt of personal gratitude to this kindly benefactor.

This new species is related somewhat closely to *Pr. ellipticum* Rogers, but differs in having brightly-hued flowers (as opposed to the wholly pale-yellowish blooms of the latter), also in several important particulars of the floral structure.

It is allied also to *Pr. regium* Rogers and to *Pr. lanceolatum* Rogers, but again it is readily recognized by the crisped nature of the outer (membranous) part of the labellum; both *Pr. regium* and *Pr. lanceolatum* possess entire (or almost so) outer margins to the labellum.

Pr. Grimwadeanum is apparently a littoral species, for it was not observed elsewhere than in heavy scrub near the beach. The peak of flowering is apparently during September.

III. *PRASOPHYLLUM GRACILLIMUM*, sp. nov.

Planta gracillima, elongata, circa 40-60 cm. alta. Folium erectum, gracillimum, spica non-excedens. Spica circiter 18-25 cm. longa, laxiuscula. Flores viridi-badii. Ovaria gracilia. Podicella sub-brevi. Segmenta-perianthii subaequalia, acuminata; sepalum dorsale lanceolatum, subconcaenum, incurvatum; sepalum laterale ad medium connatum anguste-lanceolatum; petala angustelanceolata, falcata, patentia; labellum album, subcurvatum, ovate-lanceolatum; pars membranacea ample crispa; pars callosa tenuis, alba, undulata. Columna laciniac robusta obtuse falcata, sub-basi lobulatae. Rostello longiores, apice emarginata. Anthera rostello brevior. Caudicula moderate longa.

A very slender elongated species, 40-60 cm. high. Leaf-lamina erect, very slender, terete, shorter than the spike. Flowers in a very loose spike of 18-25 cm., rather small, green with brown markings, the labellum pure white. Ovaries long and slender,

pedicels rather short, bracts shortly acuminate. Perianth-segments acuminate, of about equal length (7 mm.); dorsal sepal lanceolate, somewhat concave, apex incurved; lateral sepals connate, except at the apices, narrow-lanceolate, shortly acuminate; petals widely spreading, narrow-lanceolate, falcate; labellum on a long slender claw, semi-circularly recurved, ovate-lanceolate, shortly acuminate; membranous part white, very prominently crisped; inner plate thin, indistinct, with undulate white margins, channelled, and terminating beyond the middle. Column appendages stout, obtuse, falcate, with a small lobe some distance above the base. Rostellum higher than the column wings, with an emarginate apex. Anther shorter than the rostellum, light brown. Caudicle of medium length.

Distribution (W.A.): Yarloop (HOLO-TYPE)—*leg.* Mrs. E. Scouler, Oct., 1944.

The Type specimens of these three new species have all been lodged in the National Herbarium, Melbourne.

KEY TO ILLUSTRATION

Three species of the Genus *Prasophyllum* R.Br.

Fig. A—*Pr. paludosum*. Typical specimen, also flower enlarged. B—Flower from side. C—Column, showing anther, etc., also column wing.

Fig. D—*Pr. Grimwoodianum*. Typical specimen, also flower enlarged. E—Flower from side. F—Column, showing anther, etc., also column wing.

Fig. G—*Pr. gracillimum*. Typical specimen, also flower enlarged. H—Flower from side. I—Column wing.

(For natural sizes of specimens see descriptions.)

DEATH OF MR. C. DALEY

We record with regret the death of Mr. Charles Daley, a former president of the Field Naturalists' Club of Victoria, a former hon. editor of the *Geelong Naturalist*, and for many years a distinguished figure in educational and historical circles. Mr. Daley died in a private hospital at East Malvern on December 14, 1947, and was buried in the Brighton Cemetery on December 16. A sketch of the career of this eminent Victorian will be published later. Meanwhile, we tender sympathy to his sons, Mr. Charles S. Daley (Assistant Secretary of the Department of the Interior), Mr. Frank S. Daley (Chief Inspector of General Motors-Holdens' Australian operations), and Air-Commodore Edward A. Daley (Director-General of Medical Services, R.A.A.F.).

OCCURRENCE OF SEA URCHINS

In reply to Mr. Mollison's enquiry of September, "Are sea urchins ever found in deep water?" I would point out that in 1873 Dr. Wyville Thompson reported finding a large echinoderm (11 inches in diameter) at 400 fathoms off the Sydney coast, also a "heap of sea urchins" at 1375 fathoms (i.e. more than a mile and a half deep) off South Africa.---(Mrs.) M. E. FREAME.

A NOTE ON THE LYRE-BIRDS OF SHERBROOKE
FOREST

By A. G. HOOKE, Melbourn.

The question is sometimes asked, "Are the Lyre-birds in the Sherbrooke Forest increasing in number, or dying out?"

A careful survey 20 years ago showed that there were at least 40 birds at that time, the largest group of 14 being just east of the Falls, and the rest fairly well distributed over the remainder of the forest area. Of recent years I have sometimes thought that the number is diminishing, but seeing 19 birds and hearing several others in the course of a walk of a mile through the undergrowth on November 2nd last, through the region of greatest concentration (between the Lodge and the Falls), gives fairly good support to an estimate of a population of about 40 still, including those known to frequent other parts of the forest.

There are, as there always have been, certain parts of Sherbrooke Forest where you see neither a Lyre-bird nor a sign of their scratchings in the search for the worms, grubs, ants, spiders, etc., which go to make up the food-supply of *Menura novae-hollandiae*. The first essential to a desirable locality appears to be a readily accessible food-supply, and this is found most easily in Sherbrooke where there is the combination of deep loose soil with a forest structure consisting of an upper storey of trees, fairly closely set, and a lower storey of undergrowth, providing the cover required to retain the moisture both in the surface-soil and in the lower atmosphere, at the same time preventing the too close growth of bracken ferns.

As so much of Sherbrooke Forest is of this character it would doubtless support a considerably greater number of Lyre-birds if they were free to increase without interference by foxes, domestic cats that have "gone bush," or over-inquisitive humans who do not realize the harm that may be done by handling eggs or young birds in the nest, or frightening mother-birds during the nesting season.

In spite of the trapping of several foxes a year or two ago, they have not all been destroyed. During the Club's excursion on July 20th last, as the party was walking from Kallista along the track that winds upward by the south-eastern approach to Sherbrooke, a Lyre-bird was seen by those in front to run across the track pursued by a fox. The conclusion of the episode was not apparent.

One of the 19 Lyre-birds mentioned as having been seen on November 2nd was a young one still in the nest, though nearly ready to leave. My family have been fortunate enough to have followed the career of this Lyre-bird family through the 3½ months of the recent nesting season, and here is the story:

A week before the Club's excursion, on July 13th, we spent some time in the forest to find out all we could of current affairs in the Lyre-bird community, searching in particular for nests. In a certain locality, close to the remains of the nests of the last two seasons (well known to us when they were in use), we found a nest in the top of a low stump, in an early stage of construction. A female Lyre-bird was seen feeding nearby. Suddenly she picked up a piece of moss as large as the palm of one's hand, and quickly made off. Following at a discreet distance we saw her disappear among some bushes, to reappear without the moss.

As soon as she had moved away we quickly found her nest, also in an early stage of construction, with the piece of moss placed inside. This nest was better hidden than the one on the stump. It was on a log, built with the back of the nest against a standing tree, as is so often the case, and was pretty well surrounded by bushes. Early on the day of the excursion we paid a short visit to both nests; the one on the stump was untouched, the other was further advanced but not completed. In the circumstances it seemed best to take the Club party to all the other places of interest possible and leave this bird undisturbed. She was already running late in the season.

A fortnight later the nest appeared to be ready for use, but no egg had been laid and the birds were not seen. Two more visits were made, during August and September, and the mother-bird was found sitting closely each time. After an interval of about four weeks, the chick was found to be well advanced on November 2nd, the feathers appearing pretty well formed, and the young bird was holding its head up strongly. It probably left the nest for good within a few days, as it was not seen at our last visit on November 16th.

The nest that had been commenced on the stump has remained untouched, abandoned after a few days' work on it. It would be interesting to know why, and whether it had been commenced by our bird.

The way the bird set about building was to commence with the placing of the twigs that formed the back of the nest; she then worked forward, constructing sides and floor at the same time, lining with moss as work proceeded. I got the impression that the completion of the roof, with twigs, rootlets, and tree-fern fibre, interwoven across, came last.

Incidentally, the nesting period just passed has been such a wet one that it has imposed a greater strain on roofs than the builders prepare for—every nest I have seen this spring has had a sagging roof before the chick was ready to leave.

Last year, when searching for a nest in the same locality, my wife and children hit on the idea of separating when they found

the female bird feeding, and each walked towards a different point of the compass. As they had expected, the bird followed the one going near her nest, and presently showed signs of attacking with one wing half raised. They withdrew and watched, and soon found where the nest was hidden.

Another question: How long do Lyre-birds live in the ordinary course? Assuming that there are 40-odd birds now living in this forest, by how many generations are they younger than those which lived there 20 years ago?

HYBRID BETWEEN LYREBIRD AND COMMON FOWL

(To the Editor)

Sir,—In the *Victorian Naturalist* of June, 1946, there was published a letter from me drawing attention to a statement of the late A. W. Milligan in the *Agricultural Magazine* of 1904, that, while living in Victoria, he had bred hybrids between the lyrebird and the domestic fowl, and that he had exhibited these hybrids at a Victorian poultry show. I suggested that some member might follow up the information with a search in contemporary Victorian newspapers, but nothing has yet eventuated.

Glancing through some early issues of the *Naturalist* I came across further notes regarding these hybrids and now republish them as they assist to narrow down any search that may be made in contemporary newspapers. Will some member follow up the investigation?

In a paper, "Some Notes on the Victorian Lyrebird (*Menura victorica* Gld.)," read before the Club on March 9, 1914 (vol. 31, May, 1914, pp. 11-20), the late J. G. O'Donoghue, who was a friend of A. W. Milligan's, said: "The association of the Lyre-bird with the settlers' broods, both in a state of captivity and in its feral state, has often been chronicled, but, so far as my knowledge extends, I can only recall one instance of interbreeding being made public. Some eighteen years ago the well-known ornithologist, Mr. A. W. Milligan, then resident at Traralgon, had in captivity several hybrids, a cross between the male Lyre-bird and the domestic fowl. These unique birds, when exhibited at a Melbourne dog and poultry show, occasioned much interest, and were awarded a special prize. They were fowl-like in form, but built on a somewhat smaller scale. The plumage was lax and indeterminate, and ashy-brown in colour. The wing feathers, protruding in sheaths like a camel-hair paint brush, closely resembled hair in texture, but in any other respects, except the voice, they approximated more to the characteristic features of the domestic than to the wild stock. Mr. Milligan began a series of experiments with these hybrids, which bred freely *inter se*, and had successfully reared two generations when he broke up his home and proceeded to Western Australia . . ."

The information now given places the date of the poultry show about 1896—so a search in Melbourne newspapers need not be too wide.

Yours, etc.

H. M. WHITTELL.

Bridgetown, W.A.

NORTH QUEENSLAND NATURALISTS' JOURNAL.

This quarterly publication is now made available to non-members at an annual subscription rate of 3/-, and may be purchased from the Secretary, Mr. J. Wyer, "Lochinvar," 253 Sheridan Street, Cairns, Queensland.

GUESTS OF ANTS, WELCOME AND OTHERWISE

By H. W. DAVEY, Surrey Hills, Vic.

If anyone interested in Nature examines the inner recesses of an ants' nest he will certainly be impressed by the great variety of insects which take up their residence there, and he certainly will be astonished to learn that several different families of beetles habitually live in close association with the ants. Such insects are known as Inquilines—the term is applied to any insects which habitually live as guests or lodgers in the nests of ants, bees, wasps, etc.

Two of the most profitable ants' nests (regarding inquilines) in my experience are those of *Iridomyrmex nitidus* and *Chalcopectus metallicum*. The first species has no sting, but the green-head ant has a sting, though this is not considered severe enough to prevent anyone examining its nest.

The first life likely to attract attention, apart from the swarming and indignant ants, will be Acarids; these are not insects but belong to the Arachnida, in which the spiders are placed. These Acarids are the creatures that can be noticed occasionally fastened on to ants as parasites. It is the presence of these mites that attracts some beetles to the nests to feed on these pests. The ants probably are aware of this and welcome such beetles to their nest.

The next to claim attention will probably be the primitive insects known as spring-tails. These feed on vegetable matter and may be useful in checking the growth of moulds in the nest. A small silver-fish (*Thysanura*) is often noticed, especially in Mallee nests of ants; this is a small yellow species, but much shorter in body than the common African silver-fish sometimes so plentiful in Melbourne houses.

The caterpillars of some lovely Lepidoptera live with ants, spending all daytime in recesses of the nest, and being escorted by the ants at night to their feeding-grounds, which are the leaves of the golden wattle (*Acacia pycnantha*), usually found growing a short distance from the nest. These caterpillars (*Milveta ignita*) spend the daytime in the deepest parts of nests of the ant *Iridomyrmex nitidus*, which are usually in the decayed roots of some old stump. As soon as evening is dark enough the caterpillars emerge from the nests, to be conducted by the ants to a small golden wattle; the ants remain with the caterpillars all the time the latter are feeding, after which all return together to the nest.

This association of ants with these caterpillars is a fine example of social symbiosis, the ants protecting the caterpillars when feeding from insects and other predators. This goes on daily until the caterpillars are fully grown, when they pupate in the nest to emerge later as butterflies. So far all appears to have been in favour of the caterpillars. But the ants have received payment

for all this care and attention. inasmuch as these caterpillars when feeding secrete a honey-like fluid from glands on their backs, and the ants are extremely fond of these secretions. If this sugary secretion was not eaten by the ants as soon as secreted, the secretions would in all probability be attacked by fungi which would soon kill the caterpillars.

Some very interesting facts came under my notice when rearing these caterpillars in captivity. The butterflies were *Miletus ignita* and *Pseudodipsas myrmecophila*, both species being common at Ocean Grove in the Geelong district. One very interesting fact was that if a butterfly on emergence showed any sign of being slightly crippled it was immediately torn to pieces by the ants, whereas others emerging in perfect condition, although surrounded by swarms of ants, were never molested or injured in any manner.

A second observation was of interest as bearing on the intelligence of ants. In bringing home the stump containing pupae of *P. myrmecophila*, together with plenty of ants, it appeared that beetles which kept the acarids in check must have been left behind in the nest, as the acarids increased to an alarming extent, so that the ants became so thoroughly infested that many of them could hardly walk. It therefore made me wonder why, if ants had the intelligence often claimed for them, they did not remove the acarids, which they could very easily have done. Perhaps for a very long time this work has been done for them by the beetles and so the ants were waiting and expecting these cleansers to continue the good work.

The beetles most commonly present in nests of ants belong to the following families. *Staphylinidae*, *Pselaphidae*, *Scydmaenidae*, *Histeridae*, *Colyridae*, *Brentidae*, *Ptinidae* and *Trichopterygidae*, the last-named being the smallest beetles known. These small beetles are sometimes very numerous in ants' nests in damp localities so may be useful in controlling moulds in the nest.

There are other families of beetles found with ants, but those mentioned are the most likely to be met with.

Probably the most interesting of all beetles found in ants' nests are those belonging to the *Histeridae*, viz., *Chlamydopsis*, all species of which are highly prized by entomologists. These beetles are remarkable in many ways, one of which is the manner in which the legs can be packed away. One joint has a groove along its length so as to take in another joint, thus leaving nothing for ants to grasp. In addition, the antennae retract into the head; also its strong wing-covers, and its powerfully protected though exposed abdomen, make it look impregnable against the ants into whose nest it intrudes itself.

Several other insects, such as Hymenoptera, are also to be found with ants. These tiny wasps are probably parasitic on pupae of ants.

Orthoptera are represented by a small pallid cricket, occasionally quite numerous in some nests; also a small cockroach will be found at times. It is difficult to guess at the position a cockroach occupies in the nest. If it was hostile to ants its legs and antennae, being quite without protection, could be attacked, and so if these insects were unwelcome the ants could easily destroy them.

Some insects living with ants are totally blind, as for example a small beetle of the family *Carabidae*, viz., *Illaphanus*.

Diptera is also represented by a wonderful fly, *Microdon*, of the family *Syrphidae*, whose larvae and puparium are exactly alike in appearance and were first described as molluscs. I well remember my delight in discovering this most remarkable species in an ants' nest at Walhalla. These larvae or pupae later emerged as a fine species of Syrphid fly.

Insects of the *Coccidae* family are often looked after by ants, which roof them in for the sake of their secretions—another example of social symbiosis.

It will be noted from the foregoing that the nests of ants shelter many different families of insects, so that it appears doubtful if any nests of ants are entirely free from visitors, welcome or otherwise.

CANBERRA'S FLOWERS

Canberra in October is beautiful with new spring growth—willows fringing the lush river flats, avenues of poplars, elms, and conifers of all varieties—but where are the native plants in our Capital City? A few stately gums have been planted in stiff rows and here and there in out-of-the-way places like poor relations are wattles. Only the golden perfumed Bulbine Lily and the button-shaped Everlastings (*Helichrysum apiculatum*) hold their own amidst the woods on vacant blocks.

At the foot of Black Mountain a narrow road attacks the slope in twirls. All along the way the Showy Guinea-flower (*Hibbertia linearis* var. *obtusifolia*) flaunted large canary-yellow flowers, and *Pimelea spathulata* nodded its head above. Farther on was a large area of Silky Tea-tree (*Leptospermum myrsinoides*) covering the bare earth with a foam of delicate pink blossom. Here, too, orange-and-red Narrow-leaf Bitter-pea (*Daviesia corymbosa* var. *mimosoides*) and Heathy Bush-pea (*Pultenaea styphelioides*) bloomed, and I found a few small colonies of Broad-lip Diuris orchid (*Diuris palachila*).

Higher again the diminutive-flowered Thyme Spurge (*Phyllanthus thymoides*) grew in small tufts in the stony soil beside Daphne Heath (*Brachyloma daphnoides*) and an occasional Hakea, while great clumps of Nodding Blue Lily (*Stypandra glauca*) were covered with sapphire-blue flowers. Growing close under a tall gum-tree was one prim little plant of *Lamandra multiflora* and, nearby, *Grevillea alpestris*.

Away across the valley, the sides of Mt. Ainslie were gay with Heathy Bush-pea, and *Wahlenbergia* with flowers 1½ in. in diameter. I found Tiger Orchids (*Diuris sulphurea*) here.

Red Hill, rising above the southern end of the city, was flowerless. On the summit only a solitary she-oak sighed in the cool south wind.

ALLEN B. ABAMS.

NOTES FROM SORRENTO

By EDITH COLEMAN, Blackburn, Vic.

A penguin picked up on the ocean shore at Sorrento on May 12th appeared to have died recently. A flipper and one leg were broken. Dissected next day, the bird provided an interesting lesson on anatomy for four people.

The most surprising feature was the huge wing muscles, which explained the great power transmitted to "paddles" as the penguin darts swiftly after under-water food. The liver and gall-bladder seemed extraordinarily large for the size of the bird and are probably necessary to deal with oily fish. As the long oval stomach was empty, except for several worm parasites, we gathered that the injured penguin had been unable to hunt for some time. We were very interested in long, bristly growths, directed backwards, on the tongue and lining the roof of the upper mandible. These should give a sand-paper grip to slippery fish.

Hibernating Bats

We spent thirteen of the unusual stretch of sunny May days at the Sorrento cottage where the bats I described find sanctuary. At 6 p.m., 13/5/47, one bat only emerged for evening hunting, evidently tempted by the warm summery day and mild evening. No more were seen, although I watched for twenty minutes. I ate dinner on the verandah in the dusk several times, in order to watch the bats' exit, but they were apparently hibernating and did not appear. This was not surprising as mosquitoes and other crepuscular insects were few.

An Interesting Mantid

At Sorrento we have found several of the very small so-called hark-hunting mantids, curious insects less than an inch in length, with broadly expanded abdomen and preying forelegs. Though stated to be back-hunters, our specimens were captured on the ground.

Last year I kept one in a glass cage, feeding her on aphids and such "small deer," which she stalked and captured with her seizing forearm as expertly as her large relations. At first I gave her very small ants, as she had been a ground dweller, but these immediately attacked her, and as she offered no resistance I removed them. Did they recognize in her an enemy?

On May 10th another mantid was found on a table indoors. It appeared to have dropped from some flowers in a vase on the table. I searched other flowers in the Sorrento garden from which the flowers were brought, but found no more of the little mantids. This one is still active, 4/6/47. So closely does she resemble the humus on the floor of the cage that she is discovered only after a long search.

IDENTIFICATION OF SNAKES

Mr. R. A. Hunt's useful paper, "A Key to the Identification of Australian Snakes," has been reprinted from the December issue of the *Victorian Naturalist* and may be obtained, at 1/- a copy, on application to the Librarian, Mr. A. Burke, 7 Charles Street, Sendon, Vic.

GARDEN-GROWN PLANTS

The following examples of garden-grown native plants were exhibited at the December meeting of the F.N.C. by Mr R. Savage *Alysa grandiflora*, *Leptospermum rotundifolium*, *Kunzea sericea*, *Melaleuca pulchella*, *M. gibbosa*, *Grevillea bursifolia*, *G. Hookeriana*, *Prostanthera spinascens*, *Olearia myrsinoides*, *Calothamnus villosus*, *Halimolobos cyanea*.

WHAT, WHERE AND WHEN

General Excursions:

Saturday, Jan. 17—Queen's Park, Moonee Ponds. Subject: "Aquatic Birds." Leader: Miss M. L. Wigan. Meet 2.30 p.m., Town Hall, Moonee Ponds, corner Mt. Alexander and Pascoe Vale Roads (4d. tram section). Take Essendon tram in Elizabeth Street.

Jan. 24-26—Week-end Camp-out at Lake Mountain, Marysville. Subjects: "Alpine Botany," "Geology," "General Natural History." Leaders: Mr. J. Ros Garnet, Mr. H. Preston. Transport arranged for a party of 12 or more at 32/- return fare. Bookings, with fare, to Mr. H. Preston, 34 Coppin Grove, Hawthorn. Members to supply own camping equipment, and food requirements for five meals. Service car will leave outside State Theatre, Flinders St., at 9 a.m., Sat., Jan. 24th. For further particulars ring Haw. 1853.

Saturday, Jan. 31—Metropolitan Golf Links, Oakleigh. Subject: "Eucalypts." Leader: Mr. A. J. Swaby. 1.35 p.m. train from Flinders St.

Saturday, Feb. 7—(evening) Burke Road Bridge, East Kew. Subject: "Nocturnal Spiders." Leaders: Messrs. R. and A. Dunn. Meet leaders 7.30 p.m., Burke Road train stop. East Kew trams from Flinders St.

Special Notice:

Saturday, Feb. 21—All-day Parlour Coach Excursion to Lorne, including Ocean Road, Geelong, Angelsea, Airey's Inlet, Torquay, etc. Subjects: "Marine Life," "Geology" and "Botany." Leaders announced later. Preliminary coach bookings, reserved seats, with Mr. H. Stewart, 14 Bayview Terrace, Ascot Vale, W.2.

Group Fixtures:

Saturday, Jan. 17—Marine Biology Group. Excursion to Seaholm. Leader: Mr. A. C. Nilgen. Catch 1.29 p.m. or 2.15 p.m. train from Flinders St. Low tide, 1.5 p.m.

Tuesday, Feb. 3—Geology Group. Royal Society's Hall, 8 p.m. Subject: "Palaeontology, Pt. I," by Mr. F. S. Colliver. New members invited.

Friday, Feb. 6—Marine Biology Group. Royal Society's Hall, 8 p.m. New members welcome. Further particulars from Hon. Sec. of Group, Miss W. Taylor, 13 Jolimont Square, Jolimont, C.2.

Saturday, Feb. 7—Geology Group. Excursion to Berwick. Subject: "Fossil Botany." Leave by morning train from Flinders St. to Berwick. Require two meals.

A. A. BAKER,
Excursion Secretary.

AUSTRALIAN INSTRUMENTS INDEX

The Australian Society of Instrument Technology has recently published an Index to all types of instruments that are available through the normal trade channels in Australia, whether they be of Australian or overseas manufacture. The information supplied by about 3000 firms and agents has been incorporated.

Instruments are tabulated in alphabetical order, with the names of the firms that can supply them, and if a firm has branches in various States this is indicated as well.

The types of instruments cover a very wide range and include apparently everything in use in scientific and industrial spheres.

The Index, which promises to be extremely useful as a reference book, is priced at 7/6 and is obtainable from the Society at 93 William Street, Melbourne, C.1.

B. CALDICOTT.

The Victorian Naturalist

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PROCEEDINGS

The monthly meeting of the Club was held at the Lecture Room, Public Library, on January 12th, 1948. The President, Miss Ina Watson, and about 150 members attended.

The following were elected as Ordinary Members: Miss Stooke, Miss Dale, Mr. Floyd.

The Hon. Secretary (Mr. Colliver) conveyed greetings from the Queensland F.N.C., also from Dr. Young and Dr. Dorothy Hill.

The subject of the evening was a lecture by Mr. David Fleay, with slides on the epidiascope and motion pictures, dealing with his recent visit to America in charge of three platypuses for the New York Zoo. Sidelights of the journey and experiences in America at various Zoological Gardens were of great interest to members. At the end of the lecture questions were asked and answered and Mr. Fleay was cordially thanked.

Mr. Crosbie Morrison asked members for any information they could give regarding the butterfly called the "common Australian crow." It is a big black butterfly, more than 4 inches across the wings, and is now being seen round about Albury whereas previously it had never been known south of the middle of N.S.W.

Many exhibits were shown, chiefly botanical. Of special interest was an exhibit by Mr. H. Stewart of 102 species of plants, mostly in flower, from Mount Buffalo, including the Wiry Bauera (*Bauera rubioides*) and Milkmaids (*Burchardia umbellata*), new records for the locality, altitude 4,000 to 5,600 feet; also the Leathery Star-bush (*Pleurandropsis trymalioides*) from Mount Bogong, altitude 6,000 feet. Mr. Stewart also exhibited caterpillars and cocoons of the moth *Anthela acuta*, the emperor gum-moth and green swallowtails; cocoons of unknown caterpillars attacking *Kunzea Muelleri*, and undescribed species of harvestmen, also from Mount Buffalo.

1948 FOR AUSTRALIAN TREES

The Chief Commissioner of Boy Scouts in Victoria has recommended scouts to make a special study this year of the local trees—in bush, park or private garden. This step will be welcomed by naturalists, who will see the value of a large body of lads becoming interested. That interest can be expected to grow into appreciation and then into a desire to protect.

Members are requested to contact local scouts and to exhibit interest. If a little help and advice can be rendered, so much the better; but, at the least, let them see that good citizens are taking notice and approving.—Note by F.N.C. Committee.

A NATURAL HYBRID BETWEEN TWO ORCHID GENERA

By the REV. H. M. R. RUPP, Northbridge, N.S.W.

Some years ago a small orchid was found on the Lane Cove River by a member of the staff of Riverview College, who sent it to the N.S.W. National Herbarium for identification. It was forwarded to me, then living at Woy Woy, for my opinion. It appeared to me to combine characters of *Glossodia minor* R.Br. and *Caladenia caerulea* R.Br. No further specimens were obtained.

In September, 1947, John Young, a High School lad living at Chatswood, brought me a living plant which he had found near the Castlecove Golf Links on Middle Harbour, Port Jackson. By a less observant collector, it might easily have been passed by as an unusually dark *Glossodia minor*—a species very abundant in the locality. The dominant colour is a very deep violet. The leaf, stem, and perianth are those of the *Glossodia*. The labellum and column are definitely those of a *Caladenia*. *C. carnea* R.Br., *C. alba* R.Br. and *C. caerulea* R.Br. are all present in the neighbourhood; but the two former can be ruled out at once. *C. caerulea*, however, appears to have had a share in the production of this very interesting flower.

The labellum is twice as long, and nearly twice as broad, as that of *Glossodia minor*. Its under-surface is pale with violet suffusions. The upper-surface is deep violet like the perianth, except at the extreme base and at the revolute apex, where it is white. There are no white pubescent bosses as in *Glossodia*; the lateral lobes are curled upwards, making the labellum concave as in the *Caladenia*. At the base, however, are the two tall, semi-fused clavate calli so characteristic of *Glossodia minor*. These are very dark except at their white base. Along the whole length of the labellum runs a single median row of short clavate calli, dark except at the revolute white tip, where they also are white. The margins of the labellum are entire, and lobation is rather obscure, but there is a definite anterior constriction. Thus when the labellum is flattened out, it presents the contour of a *Glossodia* labellum. The disc and sides are marked by dark red transverse lines as in the *Caladenia*. The column is widely winged for most of its length, but the wings are not in-turned above as in *Glossodia*. There are no transverse lines. The anther is dark purple with a very acute and straight point.

Artificial hybrids have been freely raised between certain orchid genera, and have received names indicating their parentage, such as *Brassocattleya*, *Laeliocattleya*, etc. But natural hybrids between two genera, with characters admitting of no other explanation, are rarely seen, and deserve to be placed on record.

WITH THE R.A.O.U. IN QUEENSLAND

By A. H. CHISHOLM

Several officers and members of the Field Naturalists' Club of Victoria were among the sixty or so representatives of various States who spent portion of October and November in Queensland, mainly for the purpose of attending the Congress and Camp-out of the Royal Australasian Ornithologists' Union.

This was the first interstate gathering of the R.A.O.U. held outside Melbourne since World War II, and in general it was pleasingly successful. Next year's Congress is to be held at Perth, with a Camp-out on or near the historic Abrolhos Islands.

The Brisbane Congress was opened by the Minister for Agriculture (Hon. H. H. Collins), who as a North Queensland farmer made a speech animated by sound commonsense; and a civic reception was tendered delegates in the Botanic Gardens by the Acting Lord Mayor.

Portion of the time of Congress was occupied by revision of rules. Of more general interest were several motions that were adopted. One of these urged upon all municipal councils the wisdom of planting as many native trees as possible, partly to strengthen the national character of the landscape and partly to encourage native birds. Another pledged the R.A.O.U. to support Group-Captain Stuart Campbell and his company in investigating the ornithology of the Antarctic area. A third resolution pleaded in detail for proper control of the export of Australian fauna, both on the part of zoos and private citizens.

Yet another resolution recommended to all State Governments that surveys be made of the position in relation to National Parks and other Crown sanctuaries, and urged that these should be adequately controlled and properly financed. Finally, a fifth resolution took cognisance of the approaching visits of two collecting expeditions from America, and suggested that the Commonwealth and Queensland Governments should ensure that the material removed would not be such as would compel students in Australia to go abroad for the purpose of research work in any aspect of scientific study.

With the Queensland Naturalists' Club as hosts and Mr. G. H. Barker as organizer, several enjoyable outings and other gatherings were held during the Congress period. Possibly the most memorable outing was one to the lagoons at Sandgate. There many interesting birds were seen, with the decorative Jacana, or Lotus-bird, constituting the "show-piece" as it tripped lightly over the broad leaves of the lilies. Both the Jacana and the White-headed Stilt, as well as other, less "aristocratic" birds, were nesting during our visit.

The Camp-out, which extended over a week, was held at Binna Burra, on the fringe of the Macpherson Range National Park. It is a pleasant spot, and visitors generally, and especially those from the south, greatly enjoyed themselves in watching birds and in gazing at some of the epiphytal orchids of the jungle. Many distinctive birds could be seen near the guest-house—Scrub-Turkeys came to the doorsteps to be fed. Satin Bower-birds had several playgrounds within easy reach; and Rifle-birds, Flycatchers, Warblers, Fruit-Pigeons, etc., could be seen or heard during short walks.

The dominating bird-voices of the area were those of the roystering Currawongs, or Chillawongs, which in mountainous regions are always very clamorous. Frequently, too, the resounding "Walk-to-work" cry of the beautiful Noisy Pitta rang through the jungle aisles, and on occasion we heard brief but competent songs from the Albert Lyre-birds.

But the chief attractions of the region—the birds which visitors in general most desired to hear and see—were the Rufous Scrub-bird and the Olive Whistler, species which in Queensland are confined to the mountainous parts of the south-east.

The Olive Whistler, a bird having many beautiful notes, and in particular a dulcet "Peeeee-pooooo," is a denizen of the Antarctic heech-tree areas and so was not seen near Binna Burra. Little *Atrichornis*, the ill-named Scrub-bird, is more widely-spread, and specimens were located within a few miles of the guest-house. Two at least were in open forest country, a fact that surprised me considerably, for when I first recorded the species for Queensland, in 1918, all the birds seen and heard frequented heavy jungle. That was near the O'Reilly's settlement, 15 miles or so by track from Binna Burra.

You are not to suppose, however, that the term "open forest" implies that the Scrub-birds were more accessible than they are in jungle. True, the gums and casuarinas of the area were "open" in the upper storey, but down below was a wilderness of wire-grass, etc., and in this tangle the active little ground-loving birds were completely safe from observation. All we could do was listen. And how well worth while that was!

Atrichornis is a very remarkable vocalist, the possessor of an extraordinarily powerful voice relative to his size, and a highly skilled mimic of the calls of other birds. One particular specimen, which during about two hours provided an elfin concert for Mrs. Herbert Curtis of Tamborine Mountain, Gus the forester, and myself, allowed his flexible voice to range over a wide variety of borrowed notes, the most impressive, perhaps, being a beautiful extended imitation of the trill of the Fantailed Cuckoo. Some of his natural calls, too, were remarkably impressive, notably one

PLATE X



in the middle distance.

Photo.: Ina Watson.

suggesting the meowing of a kitten, another that developed into a rippling "Ta-ta-ta-ta," and another that was not unlike one of the most charming notes of the English nightingale. Between times, of course, the little master used his own "signature tune," the resounding "Chip-chip-chip-chip" that serves at once to distinguish the species. It was this imperious call that first brought us to a halt in the area, just as it caused me to "prop," in astonishment, on that first visit to the Macpherson Range nearly 30 years ago.

As I say, it was impossible to gain even a glimpse of the Scrub-birds in their grassy morass; but, a day or two later, several of the excursionists went farther afield to certain jungle areas and there saw something of the secretive singers, smallish birds clad in mottled plumage of rufous and brown. Similar enterprise resulted in brief acquaintance being made with the Olive Whistler. (Incidentally, this plain-coloured Whistler occurs sparingly in Victoria and in some abundance in Tasmania, its preference in each area being, as in Queensland, for the cool uplands. It reveals many melodious notes in these southern regions, but not the beautiful, long-drawn-out "Peeee-pooooo" of the Macpherson Range birds.)

Yet another species which engaged much attention from the Binna Burra visitors was the Eastern Bristle-bird. The presence of this bird in heathy portions of the Macpherson Range, although suspected years ago, was not revealed until recently, and because it is now very rare in New South Wales and Victoria, and because it has a sweet voice and habits akin to those of the Scrub-bird, many visits were made to the area where the species was to be found, some four miles from the guest-house. As with *Atrichornis*, it was one thing to hear the birds and another thing to see them. There appeared to be some half-dozen pairs in the favoured spot, but nobody obtained more than brief glimpses of any one of them. Apparently they were not nesting, for they refused to respond to calls and usually sprinted right away when disturbed. Every little while the birds revealed many sweet and resonant calls, notably a shrill pipe that strongly suggested the blithe aerial call of the House Swallow.

Incidentally, a Brisbane newspaper achieved a quaint error when, in the course of a reference to our activities, it "re-christened" *Dasyornis* as the "Bustle-bird." That was in fact a happy misprint, for there cannot be many birds that "hustle" to the degree that this one does.

The "Bustle-birds" strongly intrigued Queenslander Hugh Innes in particular. He went to their haunts day after day in vain attempts to locate a nest, and thereby turned his wife (as she said) into a "bird widow"—as distinct from a "golf widow." Indeed, the elusiveness of both the Scrub-bird and Bristle-bird caused our host, Mr. Arthur Groom, to wax compassionate, so that he announced

one evening that the menu would include "Baked Bristle-bird" and "Atrichornis-on-toast." "Bah!" said a tired excursionist, "you've got it the wrong way round. Atrichornis has us on toast and some of us got baked while looking for the Bristle-bird!"

Still, matters might have been much worse. In recent years the progress of ramblers in the National Park of the Macpherson Range has been made much easier by an extensive system of paths. All of these are admirably graded and all are kept in sound condition by the Forestry Department. They take rank, in my opinion, as the best series of paths in any reservation in Australia. Also, they support the view of Mr. Ronco Lahey (President of the Queensland National Parks Association), who in an address to the R.A.O.U. Congress in Brisbane urged that such areas should be kept free of motor-roads and hotels.

Assuming that other National Parks in Queensland are being safeguarded equally well, other States obviously have something to learn from Queensland in this regard. Victoria, for example, might do better by handing over its National Parks to the Forestry Commission, since the present system of control by citizen committees (which have no funds) has proved unsatisfactory.

On the whole, the Macpherson Range outing was both informative and enjoyable, particularly to southerners. Miss Ina Watson (President of the V.F.N.C.) recorded 38 species of birds new to her during the tour—most were Macpherson Range species—and one Sydneysider whose experience was limited actually boasted of 61 feathered novelties. That man was 60 ahead of me, for I noted only one species not previously seen, and that kind, as it chanced, was one known also in the south, namely, the Bristle-bird. Still, some of the birds noted had not been seen for many years, and, as most naturalists know, there is warm pleasure in meeting old friends that we have "loved long since and lost awhile."

I don't know precisely how many of the various birds were found nesting—perhaps about 20 kinds. On the journey to the Range, Hugh Innes and I saw occupied nests of the White-throated Warbler, Red-backed Wren, and Leatherhead, and on the mountains the species discovered breeding included the Brown Warbler, Yellow-throated, White-browed and Large-billed Scrub-Wrens, Whip-bird, Red Fantail, and Golden Whistler. The total number of species recorded during the Biuna Burra visit was, I understand, about 80.

For my own part, I saw about 130 kinds of birds in various parts of Queensland. For, after spending a few days on the Macpherson Range, I returned to Brisbane and went thence to "Warkon," the cattle-station of Mr. L. R. Schwennesen, some 300 miles to the south-westward; and in that part of the interior I saw, necessarily, many birds not found near the coast.

Emus are still moderately abundant on and near "Warkon," and the handsome Brolgas (Native Companions) are seen occasionally—a nest with two eggs was photographed in the middle of a swamp. Bustards, unfortunately, are now very rare; I saw only one specimen and that at a point up towards Taroom. Many kinds of water-birds were noted, both on lagoons and the Balonne River.

Most of the bird-voices of the area were harsh—such as those of the White Cockatoo, Galah, Grey Jumper, Leatherhead, Noisy Miner and Grey-crowned Babbler—but all such sounds were counter-balanced by wonderful melody, especially at dusk, from the Pied and Grey Butcher-birds. In addition, some beautiful sights were afforded by Red-winged Parrots in flight, by White Cockatoos silhouetted against the sky, by Dollar-birds cavorting in the air, and by the Rainbow-birds (*Merops*) that were nesting in the sandy soil of the homestead yards.

I saw, too, many examples of black-and-white associations—Mudlarks, Wagtails and Restless Flycatchers nesting in company—and also a number of examples of what is now known as "house squatting"; that is to say, I saw Blue-faced Honeyeaters, White-breasted Wood-Swallows, and Peaceful Doves making themselves at home in the old nests of Mudlarks. The Blue-faced Honeyeaters were also seen (as they have been seen on other occasions) occupying old nests of Babblers. "Nest-squatting" is in fact a confirmed habit of both the Blue-faced and the White-breasted Wood-Swallow, so much so that you now rarely see the "natural" nest of either of these birds.

Some of the birds noted were curiously local. Thus, although the country as a whole seemed suitable for the Crested Bell-bird and the Red-capped Robin, I encountered those species only in one spot. In the same area it was a pleasure to come upon the dainty nest, with one egg, of the Western Warbler. As I had seen the White-throated Warbler on the way to the Macpherson Range, the Brown Warbler on the Range itself, and the Mangrove Warbler near Brisbane, I had now encountered in one visit all four members of the genus *Gerygone* known to southern Queensland.

Many other kinds of birds were seen when, in the company of Mr. Schwenningen and his sons, a visit was paid to Taroom (about 150 miles north of "Warkon"), from which point, accompanied by Mr. Arthur Smith, R.A.O.U., we drove some 65 miles to Reedy Creek Station and then to the Valley of the Ruined Castles. There we were upon the trail which Ludwig Leichhardt and John Gilbert blazed in 1844. It was a memorable experience.

Ruined Castle Valley and the neighbouring Carnarvon Range are wild and highly picturesque spots. They are, moreover, rich in natural history interest. The region could well be made the site for some future camp of the R.A.O.U. or other body of naturalists.

KOALAS ON THE LOWER GOULBURN

By HARRY S. PARRIS, Hawthorn, Vic.

When I was a child my family lived on the Goulburn River near Naganibie. At this time "bears" were very numerous and at night would climb about the house, and the crying of the baby bears would waken our family. The mother bear would grab a baby and, putting it across its knee, so to speak, would spank it soundly with its open hand and the baby would cry just like a human baby.

I have a note that in 1886 my father remonstrated with a lad for shooting a bear on his property, so there was some idea of protecting the bears then.

I learned from Major Day that when his father, William Day, came to live on the Goulburn at Noorilim in 1856 he and his family lived there for about three years before they saw a bear. One day one appeared and seemed a wonder animal to them, but some of the other residents knew what it was as they had seen them in other places; however, within a month there were quite a number about, indicating a migration.

Ten years later (1868), almost at this exact spot, Mr. John Miller shot five koalas from one tree. (This would be a family, as a male bear may have as many as four wives, or possibly two females and two young bears.)

So from many records I know that from 1870 to 1890 bears were in thousands on the red-gum timber of the Goulburn and around Broadford and Reedy Creek.

I thought a lot about Mr. Day's statement and concluded that the only way to check it would be to read every book I could get that had been published before 1856 of men who had travelled in this country, from Major Mitchell onward. I carefully read over twenty books and not one of those men saw a bear in the Goulburn country, whereas each traveller in Gippsland recorded bears. An example is James Dredge, the first Protector of Aborigines on the Goulburn, who lived at Mitchell's Town for one year (1839-40) and kept a diary which he wrote up almost daily. He did not record seeing a bear.

So I think I can say there were no bears on the Goulburn when the white men arrived, and I believe this is because they were an easy meal for an aborigine. In the red-gum country they were easily procurable and so were eaten out, but in the tall-timbered country they were not so easy to obtain.

Some writers have said the blacks would not eat koalas, but I think this is incorrect. In his book, *An Australian Squatter*, W. H. Brodribb writes: "Our black man had to procure us a monkey or sloth nearly every day. The flesh is far from being nice, still we

were glad to eat it. Sometimes he would procure for us an opossum or bandicoot; they are considered a delicacy as compared with the monkey (native bear)." I therefore contend that the bears increased as the blacks decreased, and in the fifties and sixties they spread over a greatly increased area and apparently lived and thrived in red-gum country, even if they prefer the manna gum—so could we not re-establish them on the Goulburn now?

There is just one other point. At certain times the manna gums become poisonous to bears and they have to move to other trees, and this is especially true of the young tips that grow after a bushfire. We also know that on "Black Thursday" (February 6, 1851) most of Victoria was burnt, and this might have been a factor in the bears' migration.

Bandicoots used to be found in grass tussocks on the Baillieston side of the river. I wonder if there are any left now. I am pleased to find that wallabies can now (1947) be found round Baillieston, and I do hope they are allowed to multiply.

Referring again to the koala, I appeal to those property-owners on the Goulburn who have made their properties sanctuaries for native game to make an effort to re-establish the best-loved of all wild animals, the native bear, even if it means planting certain trees necessary to give the bear the variety he requires. I also appeal to the F.N.C. to assist in this matter.

THE SACRED QUETZAL BIRD

The colour-film screened by Mr. David Fleay at the January meeting of the Club contained a brief shot, taken in an American zoo aviary, of the quetzal of Honduras, the first movie of this unique bird seen in Melbourne. Recently to hand is a book *Jungle in the Clouds*, written by Victor W. von Hagen, F.Z.S., and published by Robert Hale Ltd., London. The author of this work (referred to by Mr. Fleay in his address) narrates how he achieved the distinction of being the first to capture specimens of the rare quetzals in the rain-forests of Honduras and to send them alive out of the country of their origin.

Never hitherto photographed and never caught alive, this sacred bird of the Aztecs was regarded with superstitious awe, the brilliant plumes being worn only by the chiefs and high priests. After describing its magnificent appearance and exquisite movement, von Hagen relates in vivid style the search, location and capture, gives observations on feeding and breeding habits, and sketches the elaborate preparations for the final despatch of the birds overseas.

The book scintillates with tropical local colour, as if to match the iridescence of the principal subject. Accounts are also given of the rapacious giant umbrella ants, the touamou bird, and the three-toed sloth, with other strange fauna and flora. Descriptions of the present inhabitants of the jungle, who are Jicaque Indians, the former Maya civilization that astounded the European conquerors, and the ruins with works of art in which the quetzal motif appears, as the shape of the plumed serpent, impart ethnological and archaeological character to the book.

H. C. E. STEWART.

NATURALISTS AND AUSTRALIAN HISTORY—I.

By LIONEL GILBERT, *Nabiac, N.S.W.*

The tendency of our modern world, with its haste and oversophistication, seems to be to disregard, almost despise at times, the simple yet wonderful features of nature, which we would leave to thin-bearded gentlemen with square spectacles, long white dust-coats, and butterfly-nets. Yet to study the development of our land, and the people who opened it up for settlement, means to study the efforts of a great number of naturalists who were anything but harmless or eccentric. Conversely, studying Australian naturalists and their activities means studying Australian history to the full.

Surprising numbers of the early voyagers were either naturalists or had them in the crews of their tiny sailing ships. William Dampier, the colourful buccaneer-explorer who visited the north-west Australian coasts in 1688 and 1699, published sketches of the plants, fish, etc., of New Holland in his journal (1702). Such oddities from far-off places had a great appeal in those days, and explorers made observations on unusual plants and animals. *Clianthus speciosus* was first collected by Dampier, but this beautiful red pea was later associated with Charles Sturt, so that it is now known as "Sturt's Desert Pea."

Captain James Cook had astronomers in his party to observe the transit of the planet Venus across the Sun, with Tahiti as their sighting-point. Also with the *Endeavour* were Mr. (later Sir) Joseph Banks and Dr. Carl Solander, both known to the great Linnaeus and the latter his pupil. These two naturalists spent their days at sea observing and studying bird and marine life, and their time on land collecting plants. Some of the original specimens collected in 1770 at Botany Bay were exhibited in the Royal Easter Show at Sydney this year, and the Melbourne Herbarium has many of them. Several, such as *Banksia ericifolia* and *B. serrata*, are still very common around Botany Bay. The queer plants of this new southern continent, cut off from larger land-masses for untold thousands of years, amazed the two naturalists and made them more eager to collect and preserve such treasures as they might never see again. Banks, however, was determined to see more of them, and he made sure of his aim. Many a time Cook went ashore between April 28 and May 6, 1770, to find spare sails of the *Endeavour* covered with piles of drying paper and plant specimens; in the distance might be seen the ardent pair returning, laden with more botanical wonders.

No doubt even the unpleasant Barrier Reef episode delighted Banks and Solander between June 14 and August 10. It was here that Banks had to dry some of his specimens in warm sand near

the Endeavour River while the coral-holed ship was repaired. Here, too, "an animal as large as a greyhound, of a mouse colour, and very swift" was observed—Banks found this kangaroo a most interesting object. The ship was hauled up in order to be repaired, and the water ran sternwards where Banks had stored many of his specimens. As a result some were utterly ruined. Others were almost destroyed when, after a disagreement, natives fired the grass, and the plants were saved only by sheer speed.

Banks could not forget the climate, vegetation, animal-life and native inhabitants of New Holland, especially of Botany Bay. England had lost her American colonies in 1776 and was requiring more land for expansion. Sir Joseph Banks, because of his travels, scholarship and education, as well as his influence with King George III, was looked to as a man of sound judgment. He urged that Botany Bay be settled—and quickly. Thus in 1787 the First Fleet, under Captain Arthur Phillip, set out for New Holland. Banks was overjoyed—that quaint land with its mild climate, primitive inhabitants and biological mysteries was to be settled! He began to make arrangements to have collectors explore this new field for every new biological oddity possible.

Meanwhile Phillip found that Sydney Cove in Port Jackson was the better place for a settlement, so he sailed the First Fleet out of Botany Bay just as Jean Francois Galup de la Perouse entered it with two ships, the *Astrolabe* and *Boussole*. The latter explained that he was on a scientific expedition, and remained at the bay for six weeks, during which Father le Receveur, naturalist on the *Astrolabe*, died. After leaving Botany Bay, la Perouse was wrecked in the South Pacific, in 1788. Accordingly, the French Government sent out Rear-Admiral Bruni D'Entrecasteaux with the *Recherche* and *L'Esperance* to seek him (1791-94). On this expedition went the famous botanist Jacques Julien Labillardiere, who made collections as the Admiral sailed between Capes Leeuwin and Le Brand and also visited southern Van Diemen's Land. He is remembered today in the genus *Billardiera*.

Also with this French expedition was Claude Antoine Riche, an entomologist and botanical collector. While botanizing in an area visited by a landing party (near the present town of Esperance, W.A.) he became lost, and a search party was formed with Labillardiere as one of its members. The missing naturalist had been practically without food for over 50 hours, but had made use of the fruits of a shrub, *Leucopogon Richei* (now *L. parviflorus*) to augment his food supply. His specimens were lost as a result of this mishap; but, fortunately, during the search, which traced Riche to a salt lake near Esperance, Labillardiere did some valuable collecting, including *Banksia* and *Eucalyptus* material.

Sydney Cove, in the meantime, was having a hard struggle.

Ships were late, the original expedition had been badly equipped and the young colony looked like starving itself to a standstill. Phillip sought new land, but the Blue Mountains thwarted all attempts. In 1793 Captain Paterson, a botanist who later became Lieut.-Governor of the colony, tried to cross the mountains; he succeeded only in making some botanical discoveries. The genus *Patersonia* commemorates him.

Banks still wanted information about New Holland and more specimens for his vast collections. Matthew Flinders, who had already proved himself a capable navigator and cartographer, was leaving England with the *Investigator* and *Lady Nelson* (1801) to examine the coasts of New Holland (or "Terra Australis") and Banks had Robert Brown appointed as botanist—a choice which proved to be the best that could have been made. Ferdinand Bauer was commissioned as botanical artist to work in conjunction with Brown—and work he did. By 1805 Brown was able to write that Bauer had made 1600 drawings of plants, "all accompanied by minute dissections."

At every point where Flinders landed during his circumnavigation of Australia Brown and his competent artist missed no opportunity, and Brown's efforts in particular, as a collector and describer of plants, caused the famous George Bentham to say that he exhausted the flora wherever he landed. This must have been near the truth, for in his *Prodromus Florae Novae-Hollandiae* (1810) are descriptions of 4200 species of plants.

While all this remarkable work was being done, Flinders was apparently most patient and gave the greatest opportunities possible. It must have been a stimulating sight to the keen Flinders to see two men just as interested in their work as he was in his. We should remember that the maps Flinders made on that expedition form the basis of modern Australian cartography, and the ones he made of many areas have not been repeated since. It was a tragic ending that his book, *Voyage to Terra Australis*, was only in the press when he died, July 14, 1814. *Flindersia*, *Bauera* and *Brunonia* are three genera commemorating these worthy men. On board the *Investigator* was also Peter Good, Robert Brown's assistant collector. From all accounts, his work was as good as his name, and it was with much regret that on June 11 a landing-party went ashore to bury Peter Good, who had contracted dysentery soon after the departure from Timor. Brown, as a mark of respect, named a *Banksia* and *Grevillea* after him, and the genus *Goodia* also bears his name. Flinders named the name "Australia" which gradually superseded "New Holland."

Banks had other collectors in the field. David Nelson he had sent with Cook on his third voyage and the same botanist was also on the *Bounty* at the time of the mutiny. He remained loyal to

Bligh and died of exposure in the open boat. Brown named the genus *Nelsonia* after him.

The Blue Mountains still presented a problem. A young man had written to Banks saying that he was interested in botanical collecting. Thus George Caley came to Sydney in 1800. Four years later he attempted to cross the Blue Mountains; but, like Captain Paterson and George Bass, he failed. He was able to send home much material to Banks, however, and his name is honoured in many species, as well as in the orchid genus *Caleana*. George Caley, like his colleagues, was most observant, and he it was who first discovered hybridization in the eucalypts.

Sir Joseph Banks was now becoming old; but, as the President of the Royal Society, his interest in New Holland and other areas of the globe remained as alive as ever. He arranged for Allan Cunningham to collect plants in Brazil in 1814, and then the same botanist arrived at Port Jackson in 1816 to carry out further exploration in the area his patron had examined 46 years before. Cunningham was a great success both as botanist and explorer; Banks never seemed to err in his choice of collectors. At last, the Blue Mountains had been crossed by Blaxland, Lawson and Wentworth in 1813; Surveyor George Evans had discovered the Lachlan and Macquarie Rivers; William Cox had supervised the building of the first road over the rugged sandstone country, and the interior was beckoning further explorers. John Oxley set out with a party of twelve, including three naturalists—Allan Cunningham, as King's Botanist to collect specimens and seeds for the Royal Kew Gardens and Banks; Charles Fraser, as Colonial Botanist; and William Parr as mineralogist—to explore the two newly-discovered rivers. George Evans went as second in command. The story of how the rivers both seemed to disappear in swamps is well known. In the meantime these three naturalists made full use of every opportunity to collect specimens of the types in which they were individually interested.

Once he had tasted the charm of the Australian bush and revelled in its scenery, Cunningham was determined to discover all he could about the flora of this newly-opened country, and, as a result, he assisted to open it still more. Between 1817 and 1822 Cunningham accompanied Captain Phillip Parker King (son of Governor King) on four voyages around the Australian coast, in the *Mercmaid* and the *Bathurst*. These voyages were of great importance both geographically and botanically. Areas were visited then which have been rarely touched since, especially in the Arnhem Land and Carpentaria regions. Like Brown, Cunningham found that the master of the ship offered every possible opportunity to land and collect specimens. In fact Captain King later turned to botany and horticulture himself, apparently through watching and helping the

enthusiastic Cunningham during those very long voyages in which Australia was practically circumnavigated a second time.

In an interval between these trips, Cunningham accompanied two members of a Russian expedition (M. Stein and M. Karneyeck) over the Blue Mountains on a biological excursion. Two years later (1822) he again crossed the Blue Mountains to Bathurst, and botanized in that area. He made a full account of practically all his journeys, mainly from a botanical point of view.

Bathurst became a well-established centre in the early 1820's, and not far away lay the fertile Liverpool Plains—just what was needed for pasture land. Unfortunately that part of the Liverpool Range known as the Warrumbungle Mountains intervened. Cunningham set out in 1823 to find a way through. After two weeks' searching along the mountain range, already explored without success by Lieut. William Lawson, Pandora's Pass was discovered, and at the foot of the range peach-stones were planted, "with every good hope that their produce will one day or other afford some refreshment to the weary farmer . . ." The way to the Liverpool Plains was at last open. By now Cunningham had proved himself a most ardent collector of specimens and a competent observer, but he still worked at a rapid rate. In 1826 he paid a botanical visit to New Zealand and published the results of his work there. By 1827 he was back in Australia and had discovered the valuable Darling Downs in south Queensland, a most important discovery. Again, however, there was the difficulty of a mountain range—the Great Divide separated the Darling Downs from the young town of Brisbane. With Fraser, Cunningham went to Moreton Bay by boat the following year, and soon found a pass through the mountains, now called "Cunningham's Gap." In 1829 he explored the sources of the Brisbane River.

Charles Fraser, the Colonial Botanist, died at the end of 1831, and the position was offered to Cunningham; but he declined it in favour of his brother, Richard, who was also a botanist of some note. However, as we shall see, Richard met a violent death and Allan was again offered the position in 1835, when he accepted. The story of his dealings with the Botanic Gardens of those days is a classic. He arrived in Sydney to take up the new post in 1837, but very soon found that he was not in the least interested in growing vegetables for the officers and ladies of the colony. Thereupon he "discharged the Government cabbage-garden in disgust" and commenced to embark upon "a more legitimate occupation for a few months"; and so he resigned.

The "few months" soon came to an end. In 1838 he once more spent a little time in New Zealand, but returned to N.S.W. in a grave state of health. The following year a splendid opportunity came his way in the form of a trip to the north-west with Captain

Wickham, but he was obliged to remain at home. During the last few days they took Cunningham, now hopelessly stricken with consumption, to a cottage in the Botanic Gardens for a change, but he died on June 27, 1839, after a short but tremendously important and busy life of 48 years. He was buried in the old Devonshire Street Cemetery, but it was later shifted, and the remains of Cunningham were laid to rest in the environment that pleased him most. An obelisk was constructed to contain them, and was erected in a bamboo-lined pond in the Sydney Botanic Gardens.

The problem of the swampy rivers was ultimately cleared up by Captain Charles Sturt. His published journal contains many engravings of birds (coloured) and of fossil and living shells from the various rivers he encountered. Geological notes also are included. Having explored the Macquarie, Lachlan, Murrumbidgee, Murray and Darling Rivers, Sturt set out (1845) on an expedition to the Centre. With him was John McDouall Stuart. The terrible privations endured on this trip are generally known, also the fact that Sturt went blind as a result. In the drought-stricken area he was obliged to hug the one water-hole for six months until rain fell. Near Sturt's Stony Desert the explorer found and became associated with the beautiful red and black pea, now called "Sturt's Desert Pea." Actually *Chionochloa speciosa* was collected 150 years before by William Dampier. It is interesting that two great names can both be associated with the one beautiful plant; the Sturt Pea was long known as *C. Dampieri*.

Lieut.-Col. Sir Thomas Livingstone Mitchell, who had served under the Duke of Wellington, was a soldier-explorer. His camps were lined out with military precision, the party was well armed, and, if menaced by aborigines, military tactics were employed. To see one of Mitchell's exploring expeditions making its way through unknown country was like watching an army scouting patrol. Nevertheless, Mitchell certainly obtained results, whatever his tactics. He had a very keen eye for natural objects, too, and knew the scientific names of many plants and animals; coloured engravings of birds, sketches of fossil animal remains, geological maps, portraits of aborigines, fossil shells, plants, general scenery and descriptions of new plants all find a place in his journal, *Three Expeditions into the Interior of Eastern Australia* (1838-9). The fossils collected by Mitchell on his journeys were sent to the famous palaeontologist, Professor Richard Owen, who made a very careful survey of the specimens, and amongst them found parts of a giant kangaroo and the great *Diprotodon australis*.

Mitchell is noted for his interesting and numerous observations on native tribes now extinct, and we are indebted to him for information which today would be impossible to obtain. He had

a keen eye for discerning tribal differences and in fact was a keen interpreter of all he surveyed, whether scenery, plant, animal, or rock. To discover a new species was always a source of delight to Mitchell, and in his journal are the first Latin descriptions of 77 new plants by Dr. Lindley. These are representative of 26 families. In addition, 9 species of mammals, 33 birds, 4 fishes and 6 insects were deposited by Mitchell in the Museum. Many of these were novelties, and Mitchell himself named some of the birds and mammals. Nine fossil mammals, all named and described by Owen, were collected in part, as well as seven fossil molluscs—described and named by Sowerby.

John Richardson was botanist on the successful 1836 expedition and the victim in an amusing incident. Mitchell records how the party was crossing a ford in a Victorian river; the water was deep, and the ford narrow so that "the horse of one of the party plunged into deep water with its rider, who, while the animal was still swimming, incautiously pulled the bridle, and of course overturned it, so that they parted company in the water, the horse reaching one bank, the rider the other. The latter, who was my botanical collector, Richardson, took his soaking on a cold frosty morning so philosophically, talking to his comrades as he made his way to the bank, partly swimming, partly floating on two huge portfolios, that I gave his name to the creek, the better to reconcile him to his wet jacket."

The expedition of 1835 to the River Darling had not been so amusing botanically. The botanist then was Richard Cunningham, who had the habit of digressing from the straight route of the expedition and making detours into the bush on either side to cover more country. In the Bogan River area he failed to appear one night. Mitchell says: "The occasional absence of this gentleman was not uncommon, but, as he had left the party early in the day in order to join me, it was evident, from his not having done so, that he had gone astray." In the dark a search was made for water, and finally the stars were seen reflected on the surface of a spacious pool. Cunningham failed to appear that night and Mitchell became worried. He had already "cautioned this gentleman about the danger of losing sight of the party in such a country; yet his carelessness in this respect was quite surprising." Richard was apparently determined to do his work to the best of his ability.

The next day a search was commenced. This lasted all day, but definite tracks of Cunningham's horse were not found. Back at camp it was learned that the botanist had not returned. At daylight on the third day another party was organized. This went on for days—days of seeking, calling, firing guns, blowing bugles, days of disappointment. Ultimately tracks were found and fol-

lowed; rockets and guns were fired. Cunningham had apparently been forced to kill and eat his dog; his dead horse was found, and a few of the botanist's effects, such as his coat and map. Later, the search was intensified, and Lieut. Zouch of the Mounted Police made examinations and inquiries in the area. He questioned the natives and obtained information that a white man had sought food from them. They gave him food, and he camped with them. Apparently Cunningham was delirious from hunger, thirst and exhaustion, and he was seen by the natives to be wandering around the camp at night. They decided he meant ill to them and resolved to kill him in the morning. Three of them did, by striking him with a nulla-nulla and other weapons. The trooper went to the place of the alleged murder, and found bones and pieces of a Manila hat and a coat. The remains were then assembled and a mound raised above them. The three natives (Wongadgery, Borceboomalie and Bureemal) were taken as prisoners, but the former two escaped.

(To be continued.)

LATE NESTING

The coolness of the current summer has caused many trees to be late in flowering and many birds to prolong their breeding seasons. At a spot near Melbourne on December 28 I found a blue wren's nest containing three eggs and another one with four eggs, and in the same area an occupied nest of the rufous whistler was discovered through the medium of the male bird, which was singing lustily while brooding. Moreover, nests of the Yellow Robin and the Grey Fantail, both containing eggs, were noted near Healesville as late as January 18.

In the Maryborough district on January 2 I found a yellow robin's nest with two eggs and noted a pair of grey fantails only then beginning building. At that period and in that area I discovered also two painted honeyeaters' nests and a mistletoe-bird's nest being built and four other nests of the mistletoe-bird containing immature young. Now (January 16) a note from a local resident reports that both of the painted honeyeaters are brooding eggs in their lace-like nests. Breeding in the cases of both mistletoe-birds and painted honeyeaters is governed by the supply of mistletoe berries, which in some areas have been late in ripening.

Incidentally, a dainty nest of a mistletoe-bird examined by Mr. J. H. Willis was found to be built almost entirely of thistle-down, heavily reinforced by cobweb. The usual brownish decorative material was in this instance the dried heads of wattle-blossom.

A.H.C.

NEW GARDEN MAGAZINE

Your Garden is a new monthly publication issued by the Acacia Press Pty. Ltd., Melbourne. The first number, December, 1947, contains a range of short articles by experts on various aspects of gardening. Included are contributions on Australian plants by F.N.C.V. members. Capably edited by Mr. E. E. Lord, the first issue, apart from the obligation to use newsprint paper, indicates a high horticultural standard. The 80 pages, with an attractive colour cover, makes the charge of one shilling a very modest one.

H.C.E.S.

NOTABLE NATURALISTS DIE

The Field Naturalists' Club of Victoria, in common with the community as a whole, has suffered a severe loss of late through the deaths of three sound citizens, Messrs. R. H. Croll, Charles Daley, and J. Searle. All three were former Presidents of the F.N.C.V., and all were good naturalists and loyal workers who did much to advance the interests of the Club. Sketches of the careers of our late members are given below.

CHARLES DALEY

Our late Past-President, Charles Daley, B.A., M.L.S., joined the Club in 1915 and had been a member for over 32 years at the time of his death on December 14. He was born on St. Patrick's Day, 1859, at Bendigo, where he latterly attended "The Scotch School." Entering the Education Department, he served for 46 years as a teacher, retiring from the South Melbourne School in 1924 after a long and very distinguished career.

He taught at Stawell, whence he came to know the Grampians, at Chilwell, Geelong, Sale, Box Hill and other places. Chilwell was a school of "tough lads" and Mr. Daley was warned that the place "will either make or break you." Some years after, I was present at the jubilee of my old school in Chilwell and Mr. Daley was there too. Several of the former boys who were really "tough" (according to Daley) came specially to see their old friend and tell how he had helped them to make good.

While in the Education Department he took a great interest in the cadet organization and other military matters, rising ultimately to the rank of Major. He wrote of this work in the *Victorian Historical Magazine*.

During his teaching days at Geelong, Mr. Daley was an ardent worker in the local Field Naturalists' Club. He became a President and edited the *Geelong Naturalist* for many years. Coming to Melbourne early during World War I, he transferred his principal energies to our F.N.C.V. and was elected President for the two years 1922-23 and 1923-24. He made many excursions to remote parts of the State, e.g., the sources of the Murray, and his articles on, "The Grampians," "The Life of Baron von Mueller," and the "History of the Flora Australeusis," which were republished in booklet form, will long be standard works of reference—they are models of painstaking research.

Charles Daley was a happy companion in the field. Along with C. L. Barrett, V. H. Miller and the late H. B. Williamson, he toured the Western District and Mallee in a naturalists' expedition of which I was leader (Oct., 1927). He had a cheerful disposition and, while serious in his work, always had a genial word to pass along.

As a historian he was also gifted and, along with his friends A. W. Greig, J. A. Allan and A. S. Kenyon, made Victorian history a live subject. He published many excellent articles in the *Historical Magazine*, giving particular attention to the journeys of Major Mitchell, Hume and Hovell, and Gardiner, and he travelled all over the State when cairns were erected to mark the itineraries of these explorers.

Daley wrote a *History of South Melbourne* (1940) and *The Story of Cobb & Co. in Victoria* (1946), and his *History of Gippsland* is now in the printing press. Several places in which he lived, e.g., Sale and Geelong, were favoured with brief articles and local histories. Many were the excursion reports and obituaries that he so ably compiled for the pages of this journal, and it is odd that one should now be writing an appreciation of him! He was a tireless and most voluminous writer, and I often felt that he sacrificed his own pet subjects of physiography and geology to give the world what would possibly be of wider interest—biology and history.

Above all, Charles Daley was a cultured gentleman of high attainments

and of unselfish character. We will always remember him, sitting in the front row at Club meetings, ever cheerful and helpful, giving far more than he received or expected to receive. His life was full of kindly deeds, and we shall miss him.

The sympathy of the Club is extended to Mr Daley's sons.

E. P. PESCOTT.

(For photograph of Mr. Daley see *Vic. Nat.*, March, 1925.)

ROBERT H. CROLL

Robert Henderson Croll, who died on October 18, 1947, was born in Stawell on January 4, 1869; and what an inspiration it must have been for one of his temperament to grow up in such a district! With the mine-riddle "Big Hill" as a background, the Sister Rocks and Black Range not far away, and the wonderful Grampians towering in the west, it is no wonder that young Croll early became a lover of beautiful things, a great walker and a good naturalist.

In those days he would have to go by horse or walk the 18 miles to the Grampians, which abounded in alluring creeks and waterfalls, picturesque rocks and gorges, trees, and rare flowers: there were no roads, only rough bush tracks, very little settlement and few weeds. The majesty and poetry of the Range were powerful influences in his life.

He came to Melbourne in 1886 and for six years he was on the staff of the Public Library. Then he transferred to the Education Department, remaining therein for the rest of his official life, which terminated in a most important and responsible office. He retired, as all public servants do, at the statutory age of 65, and thereafter he enthusiastically followed his bent for art, letters, poetry, walking and nature study. He joined the F.N.C. in December, 1927, and in the Club his great knowledge and experience were always at the service of members: he was President for the year 1938-39, but could not be prevailed upon to accept a second term of office.

R.H.C. was a genial and a very happy man, the friend and helper of everyone who came his way. He was always ready to impart advice from his rich experience and to praise without stint where it was due. I never met a man more universally liked—one who was "straight out from the shoulder," who made friends everywhere and in all quarters. His friends were among the artists, literary men, naturalists, walkers, businessmen, and aborigines (he was an accepted member of the Arunta tribe). In fact, nearly everybody knew "Bob." During his active life he was president or chairman of more than a dozen societies and was an interested member of as many others.

He walked Victoria from end to end, and knew almost every road or track in the State, especially among the mountains. He always held that walking was the only way to see the country.

From his friendship with artists sprang such delightful works as *Tom Roberts, The Fetched Work of John Shirlow* and other writings. His books *Along the Track* and *The Open Road* are excellent standards for the walker. His Central Australian book, *Wide Horizons*, had a big sale, and his poems are a sheer delight to read. A flair for the historical was displayed in his collaboration with Dr. Roland Wettenhall in the *Life of Dr. Alexander Thomson*, the first surgeon in Victoria and founder of Geelong—a very readable work.

Altogether, "Bob" was a cultured and versatile man, one whom we all appreciated and loved as a friend. We shall all miss him, and we tender our sympathy to his widow and son.

E.E.P.

(For portrait of Mr. Croll see *Vic. Nat.*, September, 1939.)

JAMES SEARLE

By the death of Mr. James Searle (on September 9, 1947) the F.N.C.V. has lost one of its oldest, most loyal and helpful members. Elected in July, 1885, he became President for the year 1924-25, and during his residence in Melbourne was devoted to the interests of the Club. In later years he suffered intensely from an injury to his hip which precluded his joining in field excursions. A few years ago he relinquished business in the city (in which he was largely engaged in the repair of scientific instruments and timepieces) and retired to a country residence at Narbethong.

Mr. Searle's passing will be regretted by all who, either in business or nature-study, had personal knowledge of his genial and helpful character.

Although having some knowledge of general botany through his associations with Baron von Mueller, Mr. Searle's activities in the Club were restricted chiefly to a study of cryptogamic flora and microscopic life in general. He specialized in *Eutomostraca* and, inspired by G. O. Sars, described new species of *Copepoda* and *Cladocera*, the original descriptions appearing in the *Victorian Naturalist* (three papers between Jan., 1911, and Feb., 1914).

Mr. Searle was an excellent lantern-slide maker and was entrusted with the making of slides illustrating the Club excursion to Wilson's Promontory in 1905. He not only repaired scientific instruments, but made some, e.g. (for his own satisfaction and use) a $\frac{1}{8}$ -inch oil immersion microscope lens.

A. D. HARDY.

MR. H. W. DAVEY

Since the above notices were sent to the printer we have learned of the death of another veteran naturalist, namely, Mr. H. W. Davey, of Surrey Hills. He died on December 20, 1947, at the age of 80 years.

Mr. Davey was an entomologist of standing. He took up the study as a hobby when employed in the Agricultural Department and carried on his observations, mainly into life-histories, for many years. He wrote a number of sound articles on the subject for the *Victorian Naturalist* from time to time, the last one, "Guests of Ants, Welcome and Otherwise," appearing as recently as last month. Mr. Davey checked the proofs of that article a few days before his death.

In his work at the Agricultural Department, which extended over a lengthy period, Mr. Davey rose to the position of Chief Supervisor of Orchards. It follows, therefore, that he was closely interested in economic entomology. He retired some years ago and had since been indulging in various natural history hobbies.

The sympathy of the Club will be extended to Mr. Davey's two sons.

A.H.C.

ON THE HATCHING OF CRAB-SPIDERS' EGGS

Several days before his death, the late H. W. Davey had communicated some interesting observations on a female Crab-spider to the F.N.C. His remarks may be summarized briefly as follows:

On October 11th last a large Crab-spider was captured in a bedroom and confined to a glass jar. She was fed with meal-worms, which were eaten freely, and on October 15 she spun a large egg cocoon (about the size of a shilling) and thereafter clung to it tightly, refusing all food. On December 12 (eight weeks and two days after laying) the eggs hatched and some 100 spiderlings swarmed over their mother's body, practically hiding her from view. Food was still refused by the mother by December 16, when Mr. Davey wrote this note,

PLATE XI



Jungle path near Binna Burra, where many birds and a wide variety of plants were seen.



Tame-wild Scrub-Turkey seeks food in Binna Burra yard.
(Note curious shape of tail).

"MELBOURNE'S GARDEN"

(A Review by H. C. E. Stewart)

The significance of the Botanic Gardens was perhaps not fully realized by Melbourne citizens early last year on the 100th anniversary of their foundation, as no adequate commemoration marked the event. Since then some atonement for the omission has been made by the issue of *Melbourne's Garden*, published by the Melbourne University Press.

During its century, the importance of the Gardens has of course been recognized, notably by the late Sir Macpherson Robertson, who at the city's centenary in 1935 donated a splendid building for the National Herbarium, and over the years by many celebrities who have planted historic trees.

It is now fitting that the initial outcome of Miss Maud Gibson's recent beneficence has provided funds for a worthy book. Edited by Crosbie Morrison, M.Sc. from data collated by the Maud Gibson Trust and other anonymous personnel of the Gardens and Herbarium, the book is written, and liberally illustrated, to interest the general public. Informative chapters cover the historic development, featuring such names as Charles J. La Trobe, John Arthur, the first Superintendent, Mueller, the great botanist, and William Guilfoyle, the supreme artist. We are taken by trees, lawns, lakes, and through "behind-the-scenes" machinery necessary for the Gardens' well-being. The Australian flora is given due prominence, and for the first time the scientific side is emphasized by a section on the National Herbarium, or "laboratory," as the book terms it, without which no great garden can claim to be called botanic.

Aesthetically, the Gardens owe most to Guilfoyle, who directed the media of tree, flower, leaf, stem, bark, grass, water, combined with light, air, wind and earth, to evolve a living art, to make the Gardens of justifiable renown. Because he sought his inspiration in Nature, Guilfoyle may be termed a modernist. He shunned the formalism of the straight line and the flat surface, and wrought miracles with opulent masses, towering greeneries and curves of vegetation, which he loved to mirror with water, or contrast with wide expanses of lawn. Quick to appreciate the potentialities of the comparatively unknown Australian flora, he departed from set landscape traditions, blending exotic and native plants to create new illusions of distance, new subtleties of light and shade, and new silhouettes of tall trees against the sky.

A photographer, arriving to depict Monet's Orangerie gardens at Giverny, exclaimed, "The camera can do nothing here." In the difficult task of portraying Melbourne Botanic Gardens, the same approach is evident with Mr. Morrison and his assistants: lush broader scenes, deep colours and elusive shadows seem to produce blackouts on the photographic plate. Several Australian subjects, like *Callitris arvensis*, are simply not photogenic. In general, however, the photographs are by no means unsatisfactory. Indeed, some of the larger pictures, as the double-page view of the rustic lake seen through the Central Lawn trees, are very beautiful. Undoubtedly the best picture, entitled "Snow in Summer," shows *Melaleuca leucadendron* in full bloom. Actually, the *Melaleuca* is awkwardly placed on a path edge, with no relation to surrounding plants, and in autumn the effect is stultified by nearby flamboyant dahlias. Though the dahlia stakes can be seen, the camera contrives a better subject of the tree than it really is. Incidentally, this illustration is one of the very few with a cloud background.

The Oak Lawn is allotted several pictures, but conspicuously absent are two of the noblest trees on this lawn, the Portugal Oak (planted by Lady Lorch) and the adjacent Mexican Oak. The letterpress refers rather tersely to these magnificent specimens. The Lily Lake area, finest expression of the landscape artists' genius, regrettably is compressed to tabloid mention

by the selective compass of the book. The text points out an over-emphasis on palms, not without reason. Yet Guilfoyle's free use of conifers, slow-growing evergreens, tree-ferns and palms were for permanent effects and a midwinter design. Many Gardens' lovers consider his unerring judgment displayed to best advantage in that season of the year.

Summed up, the book admirably fulfils the purpose in which it was conceived, and the general visitor will better understand and enjoy the serene loveliness of the Gardens by its medium.

AN INTERESTING SPIDER

In the *Vet. Nat.* for August, 1940, and September, 1941, I told the story of an interesting spider from Ringwood, a large silver-grey *Nephila* with a golden snare. I hoped that some of her numerous spiderlings, released in this garden, would survive to add interest to the spider population of Blackburn.

On 30/4/47 I found a fine specimen not far from my home. As there was none of the small males usually in attendance, I assumed that their remains formed part of the long strings of debris attached to the snares, evidence of good dining. Her snare was not gold, but grey. Does colour depend upon the abundance of certain prey?

In the hope that she would confirm my previous notes, I placed her in a glass cage with a dark cardboard lid. At 9 p.m. much of the crumpled snare, placed in the cage with her, had been deglutinated into a glossy black ball on which her mouth parts were still busy.

On May 1st I found that she had attempted to deposit her eggs in a bed of gold silk on the roof of the cage, and had almost completed a cocoon-like covering of flocculent gold silk. Unfortunately, the position of the cradle made deposit difficult and most of her eggs lay in a pink fluid on the cold glass floor. With a palette knife I lifted the mass, raised an opening in the "cocoon" and placed it on the small pink mass which already lay there. The mother was not perturbed, but continued to finish the silk coverlet, rubbing her spinnerets to and fro, drawing out more and more silk with first one hind leg, then the other, sealing up the margins where the eggs were visible. At times she touched the cardboard, overshooting the "cocoon," which suggested that her action was automatic, and that she worked on an area dictated by her reach, or the span of her legs.

The silk, at first a deep gold, grew paler there was little colour in it. At 2 p.m. she had completely enclosed the cradle in a glistening network of fine white silk, and was resting over it, apparently exhausted. Her body, which before was almost spherical, was now woefully shrunken, narrowly oblong in shape. The cocoon, at first a beautiful oval, was somewhat flattened, partly due to my disturbance when inserting the eggs, and partly to her weight.

At 8 a.m. next day she was working in a top corner of the cage. The cradle was faced all over from roof to walls with a filmy white network of guy ropes lashed to walls and roof. I wondered if this were to serve as a hunting-net.

Since then she has remained in the "brooding" position. Although she has probably not eaten since egg-laying, she is not emaciated. Flies have been caught and swathed in silk, but I do not think she ate them.

On June 4th I placed a fly in the cage. It was captured and swathed, but the spider returned to her brooding without attempting to eat it. In normal conditions she would probably remain thus until aware that her spiderlings are ready to emerge. One assumes that in such a loosely constructed cradle her assistance is not necessary for their release, as in the case of the huntsman and death's-head spiders, and that her vigil, or "brooding," is chiefly, if not entirely, protective.—EDITH COLEMAN.

LYREBIRDS IN A GULLY GARDEN

"Spring, 1947, has been a wet one, but the garden has been lovely nevertheless. Daffodils have never lasted so long in bloom, and now they are over, there is a whole slope of English bluebells; just a haze of misty blue.

"This year, too, Francie the lyrebird again had her nest in my garden, on a bank above the stream. To get to the nest we had to go down a muddy, slithery slope and stand in the water. The egg, in the nest for over seven weeks, was dark slate-grey. We were beginning to feel afraid it would prove a 'dud.' But one day we became very excited when a chick was seen in the nest. We handled the chick from the time it hatched until it came out of the nest in the usual 46 days. It looked exactly the same as a chick previously hatched in my garden, with jet black down standing up on its head, black down on the top of the body and bare underneath—ridiculously resembling a gollywog. The chick took kindly to being handled and would look all around when out of the nest. We saw it change from black to grey, and watched the chestnut wing-feathers emerge. As it grew bigger and stronger, it would flap its wings if removed from the nest.

"We were very delighted Francie did not take the chick away after it finally left the nest. We saw them together under a bower of ferns just near the bridge over our mirror pool. Another day, I viewed the chick under ferns near the path. We think it probably a male, as it has a bunch of plumage for a tail, just like a miniature feather duster. 'He' resembles a big grey fluffy ball with a ring of red round the neck, and red on the head just above the beak. We call 'him' Richard, after the song-hit on the wireless.

"One day, when over the other side of the gully to gather bracken, I came across Francie about to feed the chick. She looked at me—who knows me well, of course—and then went straight to her baby, talking in soft tones. I felt sure she was saying, 'Don't mind the lady, she won't hurt you. Open your mouth, Richard! Open your mouth, Richard!' She must have approached him half-a-dozen times, but he refused to open his mouth until I moved aside; then he opened it wide for the food. Later that day we saw 'him' again running shakily along the fence, just like a child beginning to run. Yes, he certainly has provided much interest in the garden this winter and spring."—From a country member in the Dandenong Ranges.

PLACE OF MEETING

The Committee would like to know the wishes of members in regard to the place of meeting. The hall at the Herbarium has been suggested as an alternative to the present meeting place, the public lecture hall at the Museum.

Some of the arguments for and against each place are as follow:

Museum Hall. Convenient to tram, comfortable seats, amplifying system. Must be out of hall by 10 p.m. Very little room to display exhibits.

Herbarium Hall. Further to walk from tram, and further from the city. No amplifier, but acoustics very good. Ample room for display of specimens. Within reasonable limits, no definite time for vacating hall. Possible to have at least part of the Club library there, and available for members.

Two members of the Committee have offered to do any necessary caretaking at the Herbarium for the Club.

You will be asked to record your vote on this matter at the February meeting, which will be held at the Museum Hall as usual. If unable to be present on that night, the Committee would like you to indicate your preference to the Secretary before the night of the meeting.

I.M.W.

WHAT, WHERE AND WHEN

General Excursions:

Saturday, Feb. 7 (evening)—Burke Road Bridge, East Kew. Subject: "Nocturnal Spiders." Leaders: Messrs. R. A. and A. Dunn. Meet leaders 8 p.m. Burke Road tram stop. East Kew trams from Flinders Street. Bring collecting tubes and torch.

Saturday, Feb. 14—Launch Excursion, Princes Bridge to Maribyrnong Road jetty via Yarra River and Maribyrnong River, stopping at Footscray Gardens for tea. Launch leaves Princes Bridge 2 p.m.; return to city via tram from Maribyrnong Road. Fare: Launch 2/6, tram 5d. Leader, Mr. H. P. Dickens; convener, Mr. A. A. Baker.

Saturday, Feb. 21 (not 28th as previously intimated)—Lorne, including Ocean Road, Geelong, Anglesea, Airry's Inlet, Torquay, etc. Subject: "Marine Biology, Geology and Botany." Parlour Coach reservations, 18/- return, with Mr. H. Stewart, 14 Bayview Terrace, Ascot Vale, W.2 (telephone FU 022, extension 457). Bring two meals and wading shoes. Midday meal can be purchased at Lorne. Parlour Coach leaves 116 Flinders Street at 8.30 a.m. (return to city about 9 p.m.).

Special Notices:

Sunday, March 14—All-day excursion (Nash's bus) to Britannia Creek, near Warburton. Subject: "King Ferns and General Botany." Further particulars from leaders, Misses A. B. Adam, and M. Elder.

Easter Camp-out, March 26-29—Heathcote-Derrinal area (one of the finest geological localities in the State). Early inquiries to Messrs. A. A. Baker and A. Burke.

Group Fixtures:

Tuesday, Feb. 3—Geology Group. Royal Society's Hall, 8 p.m. Subject: "Palaeontology, Pt. I" (first of new series), by Mr. F. S. Colliver. Intending new members contact Hon. Sec. of Group, Mr. A. A. Baker, 53 Carlisle Street, Preston, N.18.

Friday, Feb. 6—Marine Biology Group. Royal Society's Hall, 8 p.m. New members welcome. Further information from Hon. Sec. of Group, Miss W. Taylor, 13 Jolimont Square, Jolimont, C.2.

Saturday, Feb. 7—Geology Group. Excursion to Berwick. Subject: "Fossil Botany." Train leaves Flinders Street at 7.40 a.m.; return leaves at 8.7 p.m. Fare, 3/5 second return. Bring two meals.

Saturday, Feb. 21—Marine Biology Group. All-day Parlour Coach excursion to Lorne, etc.—see particulars advertised under "Special Notices."

Monday, Feb. 23—Botany Group. Royal Society's Hall, 8 p.m. Subject: "Mountain Ash Forest." New members cordially invited to attend this first meeting for 1948.

Saturday, Feb. 28—Botany Group. Excursion to Kallista-Sherbrooke. Subject: "Mountain Ash Forest." Train from Flinders Street at 9.15 a.m. to Upper Ferntree Gully, thence road motor to Kallista. Bring two meals.

Tuesday, March 2—Geology Group. Royal Society's Hall, 8 p.m. Subject: "Geology of Heathcote," by Mr. A. C. Frostick.

Friday, March 5—Marine Biology Group. Royal Society's Hall, 8 p.m.

A. A. BAKER,

Excursion Secretary.

The Victorian Naturalist

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PROCEEDINGS

The monthly meeting of the Club was held at the Lecture Room, Public Library, on February 9th, 1948. The President, Miss Ina Watson, and about 300 members and friends were present.

The President announced that a valued member, Mr. H. W. Davey, had recently passed away, and members stood in silence as a mark of respect to his memory.

The following were elected as Associate Members: Messrs. A. Thomson, K. Smith and Charles McCubbin; and as Country Member: Dr. J. L. M. Kneebone, of Hamilton.

During the evening members were asked to vote on the question of a future meeting-place. An overwhelming majority voted in favour of the Herbarium, and future meetings will be held there, through the courtesy of the Government Botanist.

The subject of the evening was a lecture by Mr. P. Crosbie Morrison on his recent tour of Japan, illustrated by natural colour slides and motion pictures. With a lively running commentary, the pictures afforded a good insight into Japanese life at the present time. Mr. Morrison was accorded the thanks of the Club.

The President spoke on the success of the recent camp-out at Lake Mountain, indicating that this was due in considerable part to the efforts of Mr. Paul Fisch, and she asked Mr. Fisch to accept an annotated album of photographs that were taken on the trip.

Mr. Gabriel drew attention to a recent note in the press that picnic vans had been crushing down seashore vegetation about Rosebud. The President promised inquiry.

Mr. Colliver commented on the remarkable number of golden bell-frogs seen on his recent visit to Brisbane, and stated he had been surprised at the homing instinct shown by some of these animals. He mentioned also that a smaller tree-frog was commonly attacked by one of the giant stag beetles.

EXHIBITS

Mrs. J. J. Freame. Series of card illustrations to show the Japanese silk industry—from eggs and young caterpillars to spools of silk thread; also puppets to demonstrate Japanese costumes.

Mr. J. H. Willis. Large globular gall on branch of Myrtle Beech (*Nothofagus Cunninghamii*), caused by the remarkable "Beech-Orange" fungus (*Cytaria Gummi*)—specimen collected near Cumberland Falls during the Lake Mountain camp-out.

DEPARTURE OF MR. F. S. COLLIVER

The warmest congratulations of the Club go to our Hon. Secretary, Mr. Stan Colliver, on his appointment as Keeper of the Collection at the Geology Department, University of Brisbane. Knowing his deep interest in geology (especially palaeontology), we are glad this opportunity has come for him to work full-time at a subject which has been of absorbing interest to him for many years.

But, of course, we cannot refrain from self-pity at the loss of both Mr. and Mrs. Colliver from Club activities, in which they have taken a leading part. Mr. Colliver was elected Hon. Assistant Secretary and Librarian in June, 1931. The following year he was elected Hon. Secretary, an office which he has held continuously since, except for the recent year of his Presidency (1946-47)—a fine record of loyal service.

To express the appreciation of fellow-members, a testimonial fund will be opened by the President (Miss I. Watson, 1 Charles St., Jolimont, C2), to whom subscriptions may be sent, or handed in at the March meeting of the Club. All money must be remitted by Thursday, 25th March.

If Mr. Colliver is still in Melbourne, it is hoped the presentation will be made at the Club meeting on April 12.

A Social Evening will also be held to give members a chance to say good-bye to Mr. and Mrs. Colliver on Thursday, April 1, at the Banquet Hall of the Victoria Coffee Palace, at 8 p.m. Tickets are 5/-, and they will be available from Mrs. Saravich at the Club meeting in March or by contacting her at 412 Whitehorse Road, Surrey Hills (WF 1425).

A special committee is in charge of arrangements. It promises an entertaining evening.

NOCTURNAL SPIDERS

On Saturday evening, February 7, about fifteen members attended the excursion to Burke Road Bridge, where many interesting spiders were examined and discussed. Approaching the Yarra, the party noted that Red-striped Spiders (*Latreutes hasseltii* Thor) and the cribellate *Phryganoporus gausapatius* (Simon) were fairly common. A fine specimen of *Aranea annulata* (Keys) was barely visible against the dead flowers of gorse.

Along the river banks, orbwebs were in profusion and naturally claimed most attention. The Leaf-curling Spider (*Phanagnatha seagueri* Rambon) was particularly common, and two species of *Arachnura* (including *A. haggisi* I Koch) were noticed and compared. Highlight of the evening was provided by a specimen of *Aranea pustulosa* (Walck), in the act of building her web. The leader, Mr. R. A. Dunn, explained the difference in webs of orb-spinner species.

During the afternoon the leader had captured several specimens of Diptera and Hymenoptera, so possibly this area would repay an entomological visit.

A.P.D.

GLENELG NATIONAL FOREST

The following letter has been received from the Minister for Lands (Mr. McDonald, M.L.A.):

"With reference to the petition from your Club and the R.A.O.U. proposing that certain defined areas of Crown lands situated contiguous with existing State Forests in the far west of the State be gazetted as a State Forest, I desire to inform you that my Department is prepared to give consideration to the listing of certain of these lands for exchange for certain other areas of State Forest under the provisions of existing legislation."

VARIOUS BIRD NOTES

By H. HUNT, Melbourne.

Concerning Emus

An emu once kept abreast of the car in which I was motoring for several miles, while the "speedo" registered 32 m.p.h. After this gallop, it finally raced ahead, crossed in front of the car, crashed through a fence, and then disappeared from sight, still running through the mulga trees. I would emphasize that the bird went *through*, not over, the fence—first one leg, then the head, the body, and the other leg, all *au l'instant*; at another time, the body would precede the head.

On another occasion I observed an adult emu with family of chicks. When the babies saw me they became agitated, but the parent called them and, grouping themselves together, they ran forward with beaks down. At given signals from the adult, their direction would change, and change again. This parent imparted instructions with head bent low to the ground, immediately behind the chicks, but with eyes fixed upon the intruder—you could almost imagine the instantaneous "half right turn" before the chicks wheeled in a body. It was a most interesting sight.

Habits of Brolgas

Some of us made our way towards a Native Companion sitting on her nest, when the mate (hitherto not seen) uttered a cry from some tall grass nearby. With wide open beak and ferocious screeching, he flew toward us. While our attention was transferred to the irate male, whom we eventually drove off, the female settled herself on a fictitious nest elsewhere and we lost all trace of the position of the real nest. Presently the male emitted some agonizing notes and appeared to have broken its wing, which it dragged about, ostensibly in great pain. We followed, intent on rendering first-aid if we got the chance; but, when a considerable distance away, the brolga rose suddenly and flew away.

Aeroplane pilots have noted the effortless flight of brolgas at a height of 15,000 feet, and it is said that they "sleep on the wing." Is this true? In various parts of Australia one may see flocks of these birds wading in lagoons or waterholes and it is claimed that if a motor-horn be tooted rhythmically the birds will dance. Is this so? They wouldn't dance for me, although the horn sounded pleasant enough!

The Drongo in Victoria

I have heard that the spangled drongo was observed at Mansfield. Is it known to frequent any other part of the State? Along the banks of the Warrego River, Queensland, these birds are numerous.

In appearance they are not unlike a raven (hence the alternative name "king crow"), but their wings are adorned with green spangles which add an attractive lustre to the prevailing jet-black glossiness, especially in sunlight. The body is smaller than a raven's and the tail is shaped like that of a fish. A harsh noisy chatter is maintained constantly.

MOUNTAIN MINIATURES, No. 1

By H. C. E. STEWART,

A few hundred yards above the 13-mile post on the road that ascends Mount Buffalo a slender watercourse runs down the rugged granite on the north-western side. The maps do not give it a name, though the flow is constant, and in the old coaching days travellers always halted there to drink the icy water. The streamlet is directed under the road and drops sharply down to the Buffalo Creek, which drains the deep gorge carved out by denuding forces over an immense period of geological time. The creek then threads dense forest, and ultimately joins up with the Ovens River system. The section of the road is known as Staker's Look-out. Superb panoramas are obtained of the ranges and valleys to the north and north-west. Directly west, the scarps of Mount Macleod and the other eminences of the North Buffalo impressively confront the nearer range of vision.

Nature-lovers wish to name the tumbling water Baeckea Falls, because here grows the lovely Fern-leaf Heath-myrtle (*Baeckea crenatifolia*), restricted along this particular streamlet. The specimen preserved in the small herbarium at the Government Chalet is labelled as found along the Crystal Brook, but this is an error, as intensive search has failed to confirm its occurrence along that waterway. Some of the plants attain a height of seven feet, and constitute the dominant under-shrub that fringes the waterfall. Appropriately, it is chiefly associated with the Wiry Coral-fern (*Gleichenia circinata*), sharing with the latter a distinct preference for running water. A party of six field naturalists inspected the spot on 4th January last and found hundreds of tiny seedlings. As we looked for flowers on the adult plants, we gained a glimpse of some blossom higher up the steep incline. But when Mr. E. E. Lord climbed up he announced the flowers as those of the Wiry Bauera (*B. rubioides*), a new record for the Buffalo.

The Alpine Ash (*Eucalyptus delegatensis*), with the Broad-leaf Kindling-bark (*E. Dolrympleana*), forms the principal forest cover of the Falls. Other vegetation, in flower and thickly crowding the vicinity, included the Christmas Bush (*Prosimnthera lasiantha*), the Common Apple-berry (*Billardiera scandens*), the Guinea-

flower Bush-pea (*Pultenaea hibernioides*), the Slender Stack-housia (*S. viminea*), and, in fruit, the Handsome Flat-pea (*Platylobium formosum*). At the opposite edge of the road, in drier soil, flourished Star-hair (*Astrotricha ledifolia*), Lemon Star-bush (*Asterolasia Muelleri*), Shining Cassinia (*C. longifolia*), Ovens Everlasting (*Helichrysum Stirlingii*), and Burgan (*Kimsea peduncularis*).

Descending to the 12-mile post (3,200 feet), near Mackay's Look-out, the Rock Isotome (*Isotoma axillaris*) delighted the eye with azure flowers of size and substance. On the journey back we stopped to examine the new Bogong Gum (*Eucalyptus Chapmaniana*), one tree only, located by a party of naturalists twelve months previously.¹ At this point, as well as near the 4,000-feet level above, further surprise awaited us in late flowers of Milkmaids (*Burchardia umbellata*), another new addition to the local flora.

The mountain contains two other species of *Baeckea*. The Rosy Heath-myrtle (*B. ramosissima*) was in full flower everywhere on the Plateau during our visit, and noticed as frequently of espalier habit on the granite rocks. The characteristic Mountain Heath-myrtle (*B. Gunniana*)² is in places up to eight feet high.

Many birds were in evidence on that crisp sunny morning. We stopped the car just below the 15-mile post, after a Spotted Quail-Thrush had run across the road. From near this point, just twelve months before, a dead bird was picked up, apparently a motor victim, and handed to Mr. E. S. Hanks for identification. A day or so later what was described as the bird's mate was seen. Several times this year the presence of the species has been confirmed in other parts of the mountain. This comparatively scarce species can now be accepted as a permanent resident, and a welcome addition to the Buffalo bird-list.

1. *Pic. Nat.*, Vol. 64, No. 3, July 1947, p. 53.

2. *Pic. Nat.*, Vol. 35, No. 11, March 1939, p. 191.

COMMITTEE MATTERS

Membership of the V.F.N.C. being now at an "all-time high"—approximately 700—it becomes obvious that thought will have to be given to limiting visitors. The committee is concerned, too, with the fact that too much of the actual work of the Club is left to relatively few members. It is considered that in such an organization every member should be able and willing to contribute to the general welfare.

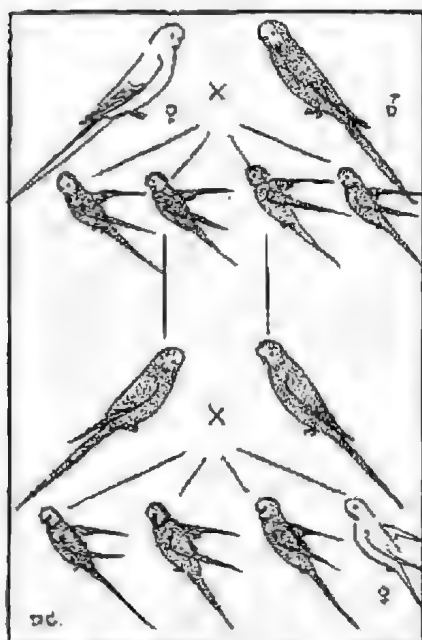
The conference of various societies dealing with National Parks in Victoria has been in recess unduly long. It is hoped that some definite action will be taken shortly. Members who visited Queensland a few months ago were impressed by that State's methods of control.

The constitution of the F.N.C. is being overhauled by a sub-committee, assisted by legal advice. It is hoped that a final report will be ready at an early date.

COLOUR BREEDING WITH BUDGERIGARS

By EDITH COLEMAN, Blackburn, Vic.

While most of us prefer to study birds under natural conditions, budgerigars may perhaps be excepted, first because their natural haunts are inaccessible to many of us, secondly because they appear so happy in comfortable captivity, and thirdly because they offer an intellectual hobby—the game of colour-breeding.



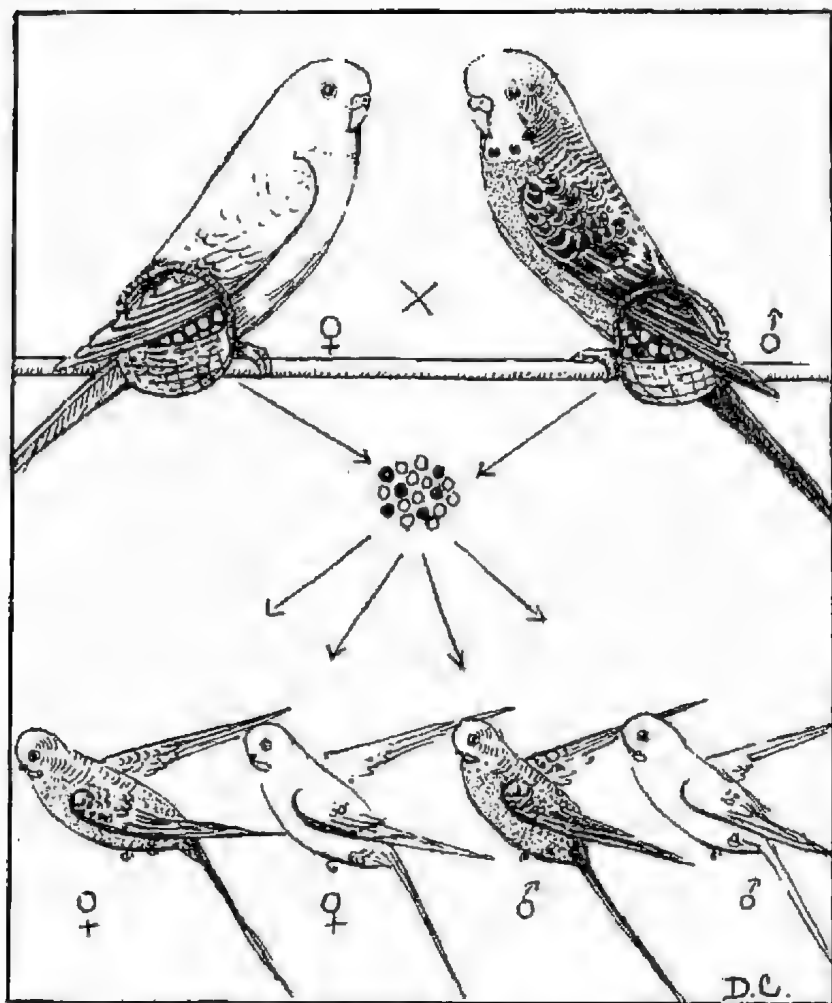
Colour Breeding with Budgerigars.
Key.—Above: An albino hen mated with a normal-coloured cock produced all "normals" (outwardly). Below: When two of these "normals" mated, an albino hen was produced, showing that the father possessed (invisibly) the factor for albinism.

Even chess players will admit that there is no more speculative and exciting game than playing with these living jewels for pawns. The game may be as simple as cat-cradle, or it may call for as close concentration as chess. One may play a not-too-scientific hand, or go more deeply into it, working out the principles of Mendelian and sex-linked inheritance. We may, of course, work out these theories on paper, following three generations of imaginary crossings, but how much more interesting to check them with living proofs!

The gardener who knows a little of plant genetics soon realizes that plant breeding follows the Mendelian principle of inheritance with almost mathematical precision. And this holds good for budgerigars until the aim is for albinos, lutinos (yellow albinos), and cinnamon-wings, in which we have sex-linked inheritance.

This sometimes occurs in man and other animals, but in budgerigars it is reversed; it is the female who passes the sex-linked characters to her sons. In other words, the factor for albinism is transmitted from mother to sons, and from those sons to their daughters.

As in plant breeding, one learns not to discard the F₁ generations, no matter how unpromising they appear. For instance, if we mate an albino hen to a normal-coloured cock (blue, yellow, green, etc.),



Reward of patience and persistence. Key.—Above: An albino hen mated with a split-albino cock. Among the innumerable factors of inheritance pooled by their union, each bird contributes the factor for albinism (borne in the sex chromosome). Below: Fifty per cent. of their offspring were albino cocks and hens.

not one of the resulting offspring will resemble the white parent. Outwardly they will all be "normals," but the cocks among them will inherit from their albino mother the factor for albinism, with power to pass it on to their daughters. Although they do not show it, these cocks are "split" albinos. Even if we mate them to coloured hens, there may be albino hens among their offspring,

because they, like their mother, carry the factor for albinism. But if we mate one of these split-albino cocks to an albino hen, there should be both albino cocks and albino hens in the resulting offspring, because in this instance both parents carry the albino factor. As the cock is only a "split" albino (outwardly a "normal") there may also be "normals" among the offspring. If now we mate one of his albino sons to an albino hen, they should give 100 per cent. albino offspring, for albino "budgies" appear to breed as true to albinism as white mice.

All of this may be clearly followed in the aviaries. For instance, in our cages an albino hen was mated to a "normal." Their offspring were, outwardly, all normals. These normals mated among themselves, and though none of them was white, some of their offspring were albino hens. So we knew that at least one male bird among them carried the albino factor—in other words, was a split-albino, with power, if suitably mated, to transmit albinism to his daughters. As he was outwardly a coloured bird (as well as his mate), there were, as one would expect, only a small percentage of albinos.

To the novice it comes as a surprise to find that the cock's possession of the sex-linked albino factor is not shown in himself but comes out in his offspring. In the hens it is apparent. One of our albino hens mated to a split-albino cock (light grey), produced twelve chicks of which six were albinos. Another albino hen mated to a split-albino cock (dark grey) produced two albinos and six light-greys. Before these six light-greys left the nest their tail-feathers showed distinct yellow colour, which later disappeared.

The feathers of adult albinos, in certain lights, sometimes show a blue sheen. This seems to bear on findings of the French zoologist Cuénot, that all albino mice have some colour in a latent condition.

In the adult coloured budgerigar the forehead cap is yellow, but the fledglings have a striped "zebra" cap, which is thrown off later. With the loss of spots, stripes and lacings, the pale and clear-wing birds seem to lose the Australian budgerigar's personality. To some of us those patterns are the "budgie."

CORRESPONDENTS WANTED

Miss Greta Lewis, of the Telephone Exchange, Kempsey, N.S.W., wishes to be put in touch with fellow-members having kindred interests. Her inclinations are toward Australian orchids, eucalypts, acacias and proteads, also phalangera and the Hymenoptera (especially wasps). Miss Lewis writes: "I am thirsting for knowledge, and my ignorance is equalled only by my enthusiasm."

NATURALISTS AND AUSTRALIAN HISTORY—II.

By LIONEL GILBERT, Nabiac, N.S.W.

(Continued from February issue)

On December 15, 1845, Sir Thomas Mitchell started from Boree once more and, with Edmund Barton Kennedy as second in command, led an expedition to the Barcoo River district in central Queensland. With this expedition went William Stephenson as surgeon and collector of natural history objects. This man later settled in the Taree district on the Manning River, N.S.W., and practised as a doctor: his name is remembered today by *Trachymene Stephensonii*. A stamp commemorating this expedition was issued during 1946.

Kennedy proved himself able, so that when it was decided to explore the North Queensland coast he was selected leader. This party landed at Rockingham Bay in 1848 and proceeded north. William Carron was botanist and Thomas Wall the general naturalist. The great Stinging Tree (*Laportea*) drove their horses mad, the rain-forests were well nigh impenetrable, the natives were numerous and menacing, and, finally, the original party had to be split up. Thirteen had landed, of whom eight were left at Weymouth Bay (including the two naturalists) and three at Shelbourne Bay. This left only Kennedy and his native servant, Jacky Jacky, who alone completed the journey after Kennedy had been speared by hostile natives (offended long before).

The relief ship was rushed back to Shelbourne Bay, where no one was found. At Weymouth Bay all had died except two—the botanist, William Carron, guarded a few specimens of plants on the beach with William Goddard; both were barely able to stand, and were in constant fear that the natives would return. The other six were buried, including Thomas Wall. Another naturalist had died for Australian exploration. Carron had collected the interesting pitcher plant (*Nepenthes Kennedyi* F.v.M.) and other plants later to be named after Kennedy. The botanist himself is remembered in the genus *Carronia* and a few species. On his return to Sydney, he published a valuable account of his trip (*Narrative of Kennedy's Expedition*) and became attached to the Botanic Gardens as collector. He died at Grafton in 1876.

A route between the tiny settlement of Victoria, at Port Essington, and the rising town of Brisbane was needed. The vast stretch of country between these two places, including all the Gulf country, was unknown. A young German botanist with charming personality, eccentric ways, and queer impulses, had such a circle of friends around him that he was able to finance a private expedition. He left the Darling Downs (discovered a few years before by Cunningham) on October 8, 1844. Undertaking himself the

botanical and geological collecting, he engaged John Gilbert as ornithologist, working for John Gould.

This expedition did not progress very favourably all through its 3000 miles, mainly because of inexperience among its personnel—except Gilbert and Leichhardt, who had done some previous botanizing along the eastern coast. The leader, however, was hampered by short-sightedness, both mental and physical, and the journey, which was scheduled to take six months, took fifteen. Gilbert and Leichhardt both kept diaries, though they did not agree in all points, as was shown some 90 years later by A. H. Chisholm (*Strange New World*). However, Leichhardt *did* collect plants and rocks and Gilbert concentrated on the birds.

The principal tragedy occurred on June 28, 1845, when natives attacked the camp one night in the vicinity of the Mitchell River. At the beginning of the uproar Gilbert jumped up and was struck in the chest by a spear. Two other members, James Calvert and John Roper, were very severely injured. Gilbert died almost immediately and was buried the next day at a service conducted by the leader. The birdman's grave was unmarked, lest it should be desecrated by the natives, and a fire was lit over it to heighten the obscurity. This grave has never been located since—although a tree nearby was marked with Gilbert's name and age—and thus another naturalist lies undisturbed amid the open spaces he loved so well. The next new river was named the Gilbert, in his memory.

At the Roper River, first sighted by one of the wounded men, poor Leichhardt was obliged to burn "nearly 3000 dried plants" and to abandon his geological collections, as horses had been drowned and transport of the specimens was impossible. It is hard to say how many type specimens were destroyed that day. A great many plants are named after Leichhardt, including the genus *Leichhardtia* and the prickly tree-fern, *Cyathea Leichhardtiana*. Whatever his faults and eccentricities, he did succeed in his first great journey and, considering the inexperience of the party, this feat was remarkable.

The same man attempted a further expedition in 1846, but this failed. In 1848 he set out again with the intention of crossing Australia from the Darling Downs to Perth, in W.A. However, the expedition was not heard of again, despite many attempts to find clues regarding its fate. As recently as 1938 attempts were made from South Australia to secure relics of the lost party, and it would seem that some success was achieved, but lack of funds caused the search party to return. It seems likely that the expedition perished somewhere in the vicinity of the Simpson Desert.

Leichhardt had not been expected in Perth until 1851 or 1852, when the gold rushes of that period attracted full attention. After

the first excitement had cooled, however, people began to ask, "Where is Leichhardt?" and search parties were organized. One of these was under the able leadership of Augustus Charles Gregory.

In 1855 a party was landed at the Victoria River, with the idea of proceeding south to cross Leichhardt's probable track. A. C. Gregory and his brother H. C. Gregory were in charge, with Ferdinand von Mueller as botanist and Wilson as geologist. This was not von Mueller's first trip—he had spent much time in the previous seven years exploring the southern regions in search of plants. Altogether, this North-West Expedition travelled 5000 miles by sea and 3000 miles by land, but no signs of Leichhardt were found other than those of his first itinerary. Much unknown country was described and the botanist in particular was very pleased with his discoveries.

Here begins a long period during which Baron von Mueller had the closest liaison with those concerned in the rural development of Australia.

The 22-year-old German chemist had no sooner landed at Adelaide (Dec. 15, 1847) than he was away in the wilds, fascinated by the quaint plant-growths of what was to be his adopted country. In 1852 he went to Melbourne, and was soon appointed to the position of first Government Botanist of Victoria. Much of his material was sent to Bentham in later years, for the compilation of the monumental work *Flora Australiensis* (1863-78).

Sir Joseph Banks now was no longer alive to inspire others with zeal for the marvels of nature in this new land; but instead Ferdinand von Mueller was in Australia and had his collectors all over the country. He travelled more than 20,000 miles himself to learn the Australian flora as no other has ever known it. The highly respected master of the King's School, Parramatta (the Rev. Dr. William Woolls) was constantly collecting specimens and making observations which were forwarded to von Mueller. Woolls himself published some botanical works, though not as many as his knowledge would have permitted. The epacridaceous genus *Woollsia* and many species bear his name.

A link between Mueller and the first Leichhardt expedition was the fact that Caroline Atkinson had married James Calvert, one of the wounded men. Before her marriage, in 1870, Miss Atkinson spent a great deal of time around her home at Kurrajong Heights, Blue Mountains, collecting for Dr. Woolls and Dr. Mueller. She is commemorated in the genus *Atkinsonia* and some species. Unhappily she died at the early age of 38, leaving a daughter. She showed great promise as a taxidermist, botanical and zoological artist, and was an authoress of some merit.

With such collectors in the field, the indefatigable Mueller was

amassing an enormous amount of material in Melbourne. The continent was not yet fully explored. The various colonies were gradually separating themselves from New South Wales and competing keenly in the fields of exploration, gold production and science. Victoria and South Australia were in the field, encouraging their respective expeditions in a race to cross the continent from south to north.

John McDouall Stuart's amazing feats, crossing Central Australia six times in an endeavour to reach the Indian Ocean first, at length won him success, and the way was clear for Sir Charles Todd to design and supervise the construction of an Overland Telegraph Line. However, Stuart did not actually win the race, for the Victoria Exploring Expedition, under Robert O'Hara Burke and William Wills, had set out in 1860 and the leaders and two others reached a point within a mile or so of the sea at the Gulf of Carpentaria. Both expeditions collected plants and other natural history specimens. Stuart's collections and those of Waterhouse (naturalist on his third expedition) were sent to Mueller, who named and described the unknown species.

Two naturalists went with the ill-fated Burke and Wills expedition: they were Drs. Hermann Beckler and Ludwig Becker. The former was medical officer and botanist, while the other was a naturalist and geologist. A number of plants was collected in the area south of the Bulloo Camp, and these were described by von Mueller. Any discoveries made by these two naturalists were overshadowed by the almost incredible series of blunders which resulted in the deaths of the two leaders near Cooper's Creek after they had eked out a miserable existence on the nardoo plant (*Marsilia* sp.), which was ground by the local natives into a kind of flour.

Four search parties were sent out to look for these men and between them they covered practically the whole of the eastern portion of the continent. Alfred Howitt's relief party contained Drs. J. Murray and Wheeler, who collected plant specimens during the search which found King, wandering about half-starved. The specimens were sent yet again to Baron von Mueller, who described them in Vol. 3 of his *Fragmenta Phytographiae Australiae*. At the same time, Mueller was writing an enormous amount of botanical literature, much of it most painstakingly illustrated, with descriptions in Latin or English.

Some men came to Australia with the purpose of collecting natural objects of interest for sale in London, where they always had eager buyers. Frederick Strange was a man who made great collections of birds, shells and plants. He knew John Gould and Captain Sturt, and travelled widely before returning to England with his treasured collections. He took home the first living

specimen of the blue water-lily (*Nymphaea gigantea*), and it was while collecting such objects again that he was killed, with three others, by the natives of Percy Island, Queensland, in 1854.

Among foreign visitors, one should mention Frau Amalie Dietrich, who, although she can hardly be styled an explorer, was incredibly active between Brisbane and Townsville for eight years (1863-71), collecting constantly for the Godeffroy Museum at Hamburg. This extraordinary woman crossed dangerous rivers and lakes in a canoe with only aborigines to aid her, disembowelled crocodiles single-handed, began a caterpillar farm for breeding out giant tropical butterflies, gathered jungle snakes and lizards, birds, and strange fishes from the Great Barrier Reef, not to mention piles of botanical material which were excellently dried in duplicate (Melbourne Herbarium has a set). She returned to her young daughter in Germany via Tonga and the Horn after an absence of ten years, and her name is for ever perpetuated in several North Queensland plants, e.g., *Acacia Dietrichiana* and *Eleocharis Dietrichiana*, also in a number of insects.

So far, the coasts of Australia had been fairly well examined, also the well-watered areas, like Mitchell's "Australia Felix," but apart from the limited investigations of Edward John Eyre, John Stuart, Charles Sturt, and Augustus Gregory, the central regions remained a mystery. Leichhardt had disappeared somewhere in that vast territory, and no one had found a trace. Suddenly, in 1869, natives in Perth spread the story of a massacre of some white men near Lake Barlee. Bones were out there near the lake as mute testimony: could such remains be those of Leichhardt? Von Mueller wrote to the Western Australian Government offering to lead an expedition to recover the relics of his countryman's expedition. However, Mueller was unable to go, but a party left Perth with Surveyor John Forrest in charge. The story proved to be a hoax, for the bones were of horses lost on a previous local expedition by Austin.

Nevertheless, during this and two succeeding trips with his brother Alexander, John Forrest (later to become Australia's first peer and the Premier of W.A.) collected many specimens of plants, which were sent to Mueller for classification and appear as a supplement in Forrest's published journal. These men crossed, in the opposite direction, the country around the Great Australian Bight already traversed by Edward Eyre, John Baxter (who was murdered) and the faithful aborigine Wylie some 30 years before. In 1873 the Forrests set out from the Murchison River, W.A., and proceeded eastward across the enormous tract of desert country. They ultimately reached Peake Creek Station on the Overland Telegraph Line, and soon the Baron had many more plants to peruse.

The collectors still continued their work, and the Baron kept pace with them in his published botanical works, which poured from his facile pen as fast as specimens were received. William Vernon, in Sydney, was a constant correspondent for 30 years, during which time he helped von Mueller obtain information for the *Flora Australiensis*.

A new and most capable explorer took to the field under the patronage and helpful influence of Mueller. Ernest Giles displayed remarkable energy and determination, second only to that of Stuart. In 1872-76 Giles was out in the central areas somewhere, now stumbling upon palm valleys, or finding water, now seeking lost friends, staggering from thirst, or sometimes arriving at the Telegraph Line just in time: but, apparently, always collecting plants for von Mueller and planting the seeds his kindly patron gave him. We can now see the reason why Central Australia is sprinkled with German names. Baron von Mueller's influence can be traced in such places as Petermann Range, Mt. Olga, Fort Mueller, Krichauff Range, Haast's Bluff, Liebig Mts., Ehrenberg Range, Mt. Ziel, Mt. Heuglin, Mt. Sonder, Mt. Ferdinand, etc., and, although many have frowned upon the nationality of such names, they link Australian science and history with geography. Most of them honour worthy scientists who were known to the Baron.

During the years 1872-74, Giles contributed 254 determined species and scores of others which could only be placed in their respective genera; many were new to science, necessitating description by von Mueller. Giles spent about 18 months in the Macdonnell Ranges, then later crossed the West Australian Desert to Perth, and was no sooner there than he re-crossed the same region farther north and returned to Peake Creek Station on the O.T. Line. Camels were used to great advantage. One of the party, Gibson, was lost in the desert west of Alice Springs which still bears his name. Giles spent some time seeking his missing friend, but he was never found. Von Mueller named an *Eremophila* after Gibson, and also one after Giles himself. In fact, it has been said that whoever made a fair study and collection of Central plants always returned with a new *Eremophila*. An examination of the specific names in this genus would appear to bear out the fact. Other explorers, too, are commemorated by species of *Eremophila*—Wills, McKinlay (who searched for Burke and Wills), Mitchell, Woolls, Fraser, Sturt, Forrest, Young (who was with Giles), Freeling (surveyor-explorer), Dutton, Delisser, Dempster, Drummond (a famous botanical collector for 20 years, who arrived in W.A. with Capt. Stirling), Elder (promoter of exploration) and many other famous names are found as historical links in this large group of pretty reddish or blue-flowered plants.

About the same time (1873), W. C. Gosse set out from the newly-discovered Alice Springs (named after Sir Charles Todd's wife) in charge of a Central and Western Exploring Expedition. He explored the Tomkinson, Townshend, Mann, Cavenagh and Musgrave Ranges, although the original intention was to go to Perth. His plant collectings were also described by von Mueller.

Thus we perceive Mueller's powerful influence on the development of Australian exploration, both by personal example and by patronage. The surveyor Charles Winnecke explored the Stuart Range in 1885 and collected yet more plants of the interior, which of course were also sent to Melbourne for description. With the prodigious amount of botanical material that von Mueller collected himself, and that which came to him from the other early explorers, it is little wonder that a great number of Australian plants now have the three letters "F.v.M." written after their botanical names. We can but marvel at this man who wrote the complete *Census of Australian Plants*; a second (1889) has in systematic order 8,839 species, of which 1,025 are not found in *Flora Australiensis*. When the Baron died in 1896, universally honoured and esteemed, leaving behind an amazing store of botanical literature, the second great influential figure in Australian geography and phytology disappeared.

Two celebrated figures stand out above all others in the history of Australian exploration (from the natural history point of view). The earlier one is Sir Joseph Banks, with whom Cook, Phillip, Cunningham, Flinders, Brown, Bauer, Good, Caley, Solander, Smith, Burton (after whom is named the genus *Burtonia*—he was accidentally killed in 1792 on the Nepean River) and other personalities are all connected, directly or indirectly, with the new colony.

The next figure is Ferdinand von Mueller, with whom are associated the names of Stuart, Gregory, Leichhardt, Forrest, Giles, Gosse, Burke and Wills, Howitt, Woolls, Mrs. Calvert, Bentham, Winnecke, Tietkins and Young (two of Giles's companions) and a battalion of lesser and local collectors.

By their efforts the workers mentioned contributed the bulk of information we now possess regarding the geography and biology of our country. Others have done much work since, and others still have not been mentioned. We should not forget, for instance, the work of William Hann, who followed up on Kennedy's work in 1872 by exploring the Cape York Peninsula. He had with him Taylor as geologist and Dr. Tate as botanist. The latter was a survivor of the tragic New Guinea expedition which had left Sydney in the *Maria*, to be wrecked on the Great Barrier Reef, where most of the expedition perished either by drowning or at the hands of allegedly cannibalistic natives north of Rockingham

Bay. The object had been to find gold, if possible, with the view of opening up the Cape. Their geological discoveries in the Mitchell River district did result in a goldfield being established there later.

As these men bore the hardships of unknown country, facing unexpected dangers, finding remarkable things, meeting strange aboriginal peoples, and discovering practically all that was new to science in the plant and animal kingdoms, it may be thought that we, of today, with our cars, aeroplanes, lines of communication and modern inventions, have no part to play in the realms of natural history. But we *have*. The country today is little less strange than it was in 1688—rather more abused, perhaps, but essentially the same. We may not discover many more new plants and animals, but we can certainly help to preserve those natural features which remain and intensify their study. We can preserve and study them for ever, if we set aside sufficient tracts of land (and suitable ones) for reservations of plant and animal life, as well as for the preservation of the original inhabitants of the country, with their fascinating customs. Surely the aborigine has already been treated badly enough in common with lesser creatures of the real Australian wild. If we do these things before it is too late, then the efforts of our forebears, their hardships, discoveries, and deaths, will have achieved the greatest possible reward.

BIBLIOGRAPHY

1. *History of Australian Exploration*—Favenc, 1888.
2. *Wildflowers of Western Australia*—Pellce, 1921.
3. *Three Expeditions into the Interior of Eastern Australia*—Mitchell, 1839.
4. *Sir Joseph Banks*—Maiden, 1909.
5. *Journ. Royal Soc. N.S.W.*, 1908 ("Records of Australian Botanists")—Maiden.
6. *Travels in Central Australia*—Giles, 1875.
7. *Second Systematic Census of Australian Plants*—von Mueller, 1889.
8. *Strange New World*—Chisholm, 1941.
9. *Concise History of Australia*—Wood.
10. *Tracks of McKinlay Across Australia*—Davis, Westgarth, 1863.
11. *Leichhardt Letters*—Poltzer, 1944.

PLACE OF MEETING

As an overwhelming majority of members voted in favour of the Herbarium, meetings will be held there in future, by kind permission of the Director. Meetings will begin at 7.45 p.m. as usual, and at the next one (March 8) we shall be privileged to hear Dr. David Johnston (Smithsonian Institute, U.S.A.).

The most direct route is to take a Toorak tram in Swanston Street and alight at the first stop in Toorak Road, i.e., at Melbourne Grammar School gate.

THE SOUL OF A MAN OF SCIENCE

By TAILTON RAYMENT, F.R.Z.S., Melbourne.

A very distinguished naturalist has passed from the ken of man. Professor-*emeritus* T. D. A. Cockerell occupied the Chair of Zoology at Colorado University for many years, and was a vigorous member of the International Committee for Zoological Taxonomy. As a young man he studied under the famous anatomist, Sir John Bland-Sutton, who was the first to inform the world that a gall-bladder was not essential to man's health and vigour.

Professor Cockerell's name will always be remembered in Australia, for he published an immense number of papers on Australian insect species, and in 1932 the Zoological Society of New South Wales issued several of his *Keys to the 1,400-odd Australian bees*—a work which, although not yet completed, will serve for all time as foundation literature.

His research had a very wide ambit: fossils, snails from Peru, fish-scales from all over the world, the intestines of rodents, the water-lie of Lake Baikal—no one could charge him with over-cropping a narrow field. I have never forgotten his advice: "Always remember that Art and Science, to be of real value, must be presented in terms intelligible to your fellows."

Last year, feeling his health waning, Professor Cockerell looked forward to regaining his vigour by a long sea voyage, and to re-visiting Australia with his wife, in 1948. He expressed the wish that I should continue with the work of completing the *Keys*, and I trust I shall be able to do this as a memorial. He was a modest, lovable man, with an immense humanity which is faithfully indicated in his tribute to a loved friend, the famous Alfred Russell Wallace:

"The love of Nature makes the whole world kin,
So, east and west, the gospel preached herein
Must stir the soul.
All living things his comrades were; he saw
The harmony which underlies all natural law;
Saw Nature whole."

The late Professor inscribed these lines in a treasured personal copy of his own volume, *Zoology*, and I feel that nothing I could write would surpass his own gracious tribute to a noble soul.

Theodore Cockerell was not a "typical university professor." Born in England, in 1866, of a family which had distinguished itself in cultural attainments, he enjoyed the company of many famous people. Threatened with chest trouble, he went out to Jamaica and worked there for a few years in the Museum, but, when greatly improved in health, returned to England. However, the cold and damp brought on a recurrence of the trouble, and he arrived in Colorado in 1887 to occupy the Chair of Zoology—with unstanding success.

Although he had retired when World War II burst upon the world, he went to work at Palm Springs, replacing the young curator at the Desert Museum, and while there he wrote a classic paper on the "Origin of the Colorado Desert." This publication is often cited to exemplify a first-class scientific paper.

It was difficult to believe that such a large, robust spirit could find lodgement in such a small, frail body, and the naturalist always seemed more of the spirit than of the body, yet he had travelled the world, even in wild, untutored lands—he journeyed through Turkestan and Siam by pony train.

At the University he had served with such honour he was regarded as a most exceptional man, and although a naturalist of the first order, he was once invited to deliver a series of University lectures on English reformers,

for he had known the friendship of many eminent ones: John Bright, Ruskin, William Morris, Florence Nightingale, a galaxy of truly great minds.

He was a gracious soul, albeit a most painstaking one, and students who disfigured specimens with large and untidy labels irritated him, for he himself wrote an amazingly neat "hand," but, oh! so minute, and in such straight lines even on unruled paper.

One day in the field, a student brought him a singularly puzzling specimen with the query—"What *exactly* is this, Professor?"

The scientist studied it intently for a while; then he replied with a whimsical smile, "How should I know, when I've left all my brains in the library?"

In all truth, the great museums of the world do really hold his brains, for almost every one of them is indebted to him for his determinations of specimens.

Seeking material for experiments in genetics, he seized upon the sunflower, and produced the red and claret ones which grace our gardens today.

He was very ably assisted in this work by his wife, Wilmatte P. Cockerell, herself a graduate of Berkeley University and with a humanity as great as that of her husband.

Both the Professor and his wife spent much time on behalf of the suppressed and neglected races of the earth, and they were doughty champions, too, travelling the world with film-pictures and lectures to help mankind reach his true estate.

In 1947 Professor Cockerell travelled down to deliver a series of lectures to a Pan-Central American Congress in Honduras, but on the long flight home he was taken seriously ill, and the present abnormally cold wave sweeping America proved too severe for his frail constitution. He died on January 29, at San Diego, California. *Vale, Master!*

He is survived by his widow and his brother, Sir Sydney Cockerell, sometime Custodian of the Fitzmaurice Museum at Cambridge. Another brother, Douglass, gained fame as a binder of classic books, some of which were recently on exhibition at the Melbourne Museum.

MORTALITY AMONG BIRDS

(To the Editor)

Sir,—Destruction of bird-life in recent months was indeed great. The boisterous weather of spring and early summer took a large toll of fledglings as well as of chicks still in the shell. Around my home many young birds of introduced species were found dead. On the other hand, a friend of mine had under observation a pair of blackbirds which, safely protected by thick scrub, reared four broods during the season. This seems to be a record.

It would be helpful in extending our knowledge of bird-life if records were made of the approximate number of broods our nomadic and non-nomadic birds produce in a normal season as a basis for a census of the bird-population of the Commonwealth. Some of our birds on the eastern littoral go north to breed in the greater warmth during the cold months of the south, and then gradually make south as the weather becomes more congenial. Some of them breed again in the eastern States en route. The same applies to parts of Western Australia.

Yours, etc.,

ARTHUR H. E. MATTINGLEY.

Glen Iris,
January 30, 1948.

THE WILD-FLOWER GARDEN SECTION OF THE F.N.C.

In the Club are many members keenly interested in the cultivation and conservation of Australia's wild-flowers.

With the idea of bringing together these wild-flower culturists in somewhat closer contact than is possible at our monthly general meetings, a new Group was recently formed. By decision of members it is to be known as the "Wild-Flower Garden Section." Inaugurated in December last, the Group's second meeting was held at the Royal Society's Hall on Thursday, February 5, when Mr. Hammer gave an address on the practical aspects of native plant cultivation.

Section meetings will be held at the Royal Society's Hall on the first Thursday in each month, and new members will be cordially welcomed.

For its immediate concern the section will have a close interest in Maranoa Gardens, Bahwyn—gardens famed for the excellent assemblage of Australasian plants—and it will endeavour to examine the possibilities of sponsoring for establishment of a complementary Australian Wild-flower Garden in the red sand area to the south or south-east of the City.

It is the intention of the section to maintain a seed collection for distribution among members of the Club and other interested people, and to this end its members would welcome the receipt of selected seeds of any desirable native plants. Any such collections should be carefully annotated with such details as date of collection, type of soil or country in which the plant occurs, general aspect of the plant, and, of course, its name.

J.R.G.

A NEW INSECT BOOK

The paucity of current entomological literature makes welcome to the Club library C. H. Curran's *Insects of the Pacific World*. The book forms one of the Pacific World Series sponsored by the American Committee for International Wild Life Protection, and published by the Macmillan Company, New York. Events in the present decade have focused attention on the Antipodes, so it is not surprising that nature-minded people overseas, as well as servicemen, have become conscious of the vast comparatively unexplored insect fauna of these great ocean islands and contiguous countries.

The author states that about 50,000 insect species are known from Australia to Formosa, Japan and the Aleutians, and from the Galapagos and Hawaii to New Zealand, Sumatra and Burma. "Each year thousands of different kinds are being described. If we only knew even a part of the unbelievable things that are a necessity in the lives of insects, we might change our ideas about them." Such words indicate the motive of the book, and at least a good jumping-off place is provided for beginners in entomology, with a basis for study of the Australian insect world.

Elsie B. Kloss writes delightfully on the dragon-flies and damselflies. The nymphs of Odonata are one of the most remarkable insect forms, and certainly the most rapacious. The dragon-fly nymph anticipated man and evolved a system of jet propulsion, in the manner the insect darts through water.

The scope of the book is extended to include the Arachnids and their allies, dealt with engrossingly by Dr. Willis J. Gertsch. He alludes to the angler spider of Australia, *Diavolus magnificus*, which spins its web loaded with a drop of sticky fluid, and held to catch prey in the manner of a fishing line. Keith C. McKeown, of the Australian Museum, has already made familiar this unique spider. Some of the crab-spiders (Thomisidae) lurk in flowers to pounce on insects lured by the nectar. Various Thomisidae can change colour to harmonize with their floral surroundings.

The general reader will gain from this compressed work considerable enlightenment on the principal insect groups. In its pages are bestowed many informative morsels, as, for instance, how the click-beetle "clicks," or how the firefly produces its "lights." The ordinary person will also be edified to discover that partheno-genesis occurs in some beetles, that not all "lady-bugs" are beneficial, and that the idea of shifting bees from place to place to get a continuous flow of nectar is not a modern practice, but dates back at least to the third century B.C.

H. C. E. STEWART.

WHAT, WHERE AND WHEN

General Excursions:

Sunday, March 14—Britannia Creek, near Warburton. Subject: "King Ferns and General Botany." Leaders: Misses A. B. Adams and M. Elder. Nash's bus leaves Bannan Avenue 9 a.m. Bookings (7/6 return) with Mr. H. Preston, 34 Coppin Grove, Hawthorn (Tel. Haw. 1853). Bring two meals.

Saturday, March 20—Botanic Gardens. Subject: "Australian Trees—Autumn." Leader: Mr. F. P. Morris. Meet at main entrance (Gate "F"), near National Herbarium, 2.30 p.m.

March 26-29—Easter Camp-out, Heathcote-Derrimul. Subjects: Geology, Botany, Birds and General. Enclosed van will leave Batman Avenue 9 a.m. Good Friday. Van will be used for all excursions during Camp. Members are requested to supply own camping gear, but those wishing to attend without gear should contact Excursion Secretary. Provisions can be obtained alongside Camp. Transport cost about £2, according to number attending. Bookings, with fare, to Mr. A. A. Baker, 53 Carlisle Street, Preston, N.18. Further particulars at March general meeting.

Saturday, April 3—National Museum. Subject: "Australian Marsupials." Leader to be arranged. Meet at Russell Street entrance at 2.30 p.m.

Saturday, April 10—Beenak. Subject: "Fungus Foray." Leader: Mr. J. H. Willis, B.Sc. Nash's bus leaves Batman Avenue at 9 a.m. Bookings (8/6 return) with Mr. R. D. Lee, 18 Normanby Avenue, Middle Brighton, S.5. Bring two meals.

Preliminary Notice:

Saturday, May 1—All-day Parlour Coach Excursion (200 miles) to Strzelecki and Loch. Subject: "Gippsland Giant Earthworm." Leader: The President (Miss Ina Watson). Coach bookings (22/6, inclusive of midday meal) with Mr. H. Preston, 34 Coppin Grove, Hawthorn (Tel. Haw. 1853).

Group Fixtures:

Friday, March 5—Marine Biology Group. Royal Society's Hall, 8 p.m.

Saturday, March 20—Marine Biology Group excursion to Black Rock. Subject: "Life at low tide." Take 1.45 or 2.3 p.m. train to Sandringham, connecting with Black Rock tram or Beaumaris bus to Balcombe Road. Bring walking shoes and afternoon tea.

Monday, March 22—Botany Group. Royal Society's Hall, 8 p.m. Subject: "Lagoons and River Banks."

Friday, April 2—Marine Biology Group. Royal Society's Hall, 8 p.m.

Tuesday, April 6—Geology Group. Royal Society's Hall, 8 p.m. Subject: "Palaeontology, Part II—Protozoa."

Thursday, May 6—Wild-flower Garden Group. Royal Society's Hall, 8 p.m.

A. A. BAKER,
Excursion Secretary.

The Victorian Naturalist

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PROCEEDINGS

The monthly meeting of the Club was held at the National Herbarium on Monday, March 8, 1948, the President (Miss Ina Watson) and about 300 members and friends attending.

A welcome to American visitors and to Mr. C. P. Mountford was extended by the President, who referred to an outing that had been arranged for them at the week-end. Mr. Mountford spoke on the personnel and aims of the forthcoming expedition to Arnhem Land and stated that Australian science and museum collections should benefit from this combined party, in which the Smithsonian Institution and National Geographic Society of U.S.A. were playing a conspicuous part.

Miss Nonie Wright was elected as an Ordinary Member of the Club.

Mr. G. N. Hyam introduced the subject of the naturalized Italian white snail (*Helix pisana*). The distribution of this mollusc in Victoria, South and West Australia was discussed at some length in relation to its food plants—evidence seemed to indicate a purely coastal habitat.

Mr. A. D. Hardy reported the death of many magpies in Drouin district, owing to the birds' feet becoming entangled with waste material from a local flax mill. Threads adhered to the birds' feet, and later caught in the branches of trees, the victims dying slowly. Mr. Hardy intimated that he had written to the Fisheries and Game Department about the matter.

Mr. H. C. E. Stewart reported having recently heard a grey thrush mimicking certain other native birds—apparently a rare occurrence.

WILD LIFE PRESERVATION IN U.S.A.

Dr. David Johnson, mammalogist from the Smithsonian Institution, showed two films, "The Fort Niobrara (Nebraska) Wild Life Refuge" and "The Canadian Porcupine." He gave a running commentary on these splendid motion pictures in colour, which were of outstanding merit and greatly appreciated by the audience. At the conclusion of the films, members asked several questions, which were answered by Dr. Johnson who, in turn, asked some questions concerning Victorian wild life, particularly as to the

Dandenong Ranges. A vote of thanks was proposed by Mr. S. R. Mitchell, seconded by Mr. F. S. Colliver and carried by acclamation.

EXHIBITS.

Mr. J. S. Seaton. *Beaufortia sparsa*, garden-grown at Caulfield (a magnificent myrtaceous plant from W.A. with vivid scarlet flowers of the "bottle-brush" type).

Mr. P. F. Morris. Eucalypt branchlet attacked by the remarkable coccid scale insect *Aspidiotus munita*—both male and female galls. The masses of reddish gall-tubes are sometimes called "vegetable coral."

SWARMING OF THE DUSKY WOOD-SWALLOWS

By EDITH COLEMAN, Blackburn, Vic.

The Dusky Wood-Swallows are again clustering. They have been among our trees since the middle of February. Although we did not look for the swarm until March 1st, they had probably been clustering for some time.

It has taken place this year at approximately the times recorded for 1944,

1945, 1946 and 1947, and follows the regular routine—hawking, play and song among the trees until the sun goes down, then clustering with much chattering. A few birds form little groups of two, and threes, preening and twittering until they, too, join the cluster. They utter many pretty, low notes before finally settling down.

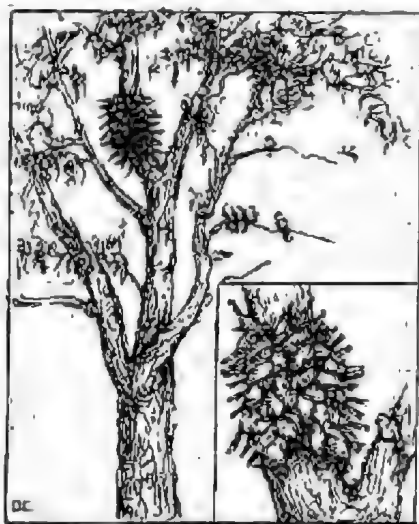
As usual, they "float" in high overhead from the south-west at about 20 minutes to 7, uttering somewhat plaintive calls. From overhead their singing is rather like that of the British song-thrush, perhaps muted or whispered. It is pretty to see them alight on the boughs, tails swinging from side to side so that the white shafts are seen.

That the removal of trees, and an almost completed house within a few feet of their favourite trees, together with the sounds of building, have not driven them away suggests a strong attachment to one spot. They probably do not desert

the district at all, as we often see them in smaller parties at other periods of the year. They have nested in our trees and in others nearby.

Reference to previous dates (V.N., 1944, 1945, 1947) will show how accurately they time their swarming: the 1944 cluster noted Feb. 26th and 27th (my husband saw it for a further week in our absence); 1945, Feb. 17th to Feb. 27th; 1946, Feb. 18th to March 12th. As we are sometimes very busy at this time of the evening, we have probably missed many clusters.

On March 6th my daughter sketched the cluster, using opera glasses for a "close-up." It may interest those who have not seen the clustering.



TWO NEW SPECIES OF ORCHIDS FROM TASMANIA

By W. H. NICHOLLS, Melbourne.

I. *CALADENIA CAUDATA*, sp. nov.

Planta subrobusta vel gracilis, hirsuta, circa 10-12 cm. alta. Folium lanceolatum, canaliculatum, hirsutissimum, circiter 9 cm. longum. Bractea subulata ad medium caulis. Flos solitarius, luteo-viridis et rubro-atropurpureus, in diametro fere 4 cm. Segmenta perianthii ad basin dilatata, deinde in caudis caudata, multi-glandulosa; sepalum dorsale erectum, incurvum, circa 3 cm. longum; sepala lateralia reflexa similia; petala circa 2.7 cm. longa. Labellum unguiculatum, subovatum, cuneatum; apice caudatum, multi-glandulosum, decurvum; marginibus pectinatis et dentatis. Calli lineares curvi, pedati, atro-purpurei, 6-seriati. Columna erecta, incurva, circa 1.2 cm. longa, superne latiuscule alata ad basin bicallosa. Anthera brevissima.

A moderately robust or slender hairy plant 10-12 cm. high. Leaf lanceolate, hairy, channelled, about 9 cm. long, with a subulate bract about the middle of the stem. Flower solitary, yellowish-green with purplish and some red markings, the apices of segments purplish-black, about 4 cm. in diameter. Perianth-segments dilated at the base, then narrowing gradually to purplish-black tail-like points, the tips very glandular, glands invading to some extent the laminal portion; dorsal sepal erect, incurved; lateral sepals similar to the dorsal, and about the same length (3 cm.); petals narrower and a little shorter. Labellum on a movable claw, subovate-cuneate with a tail-like, very glandular decurved apex about 6-8 mm. long. Margins pectinate, more or less regular, dentate towards the tip. Calli linear, curved, almost black, in 6 rows ending at the bend (some calli foot-like). Column erect, incurved, about 1.2 cm. long, winged widely on each side of stigma, with two stalked glands at base. Anther short.

Flowering in September.

Distribution: Tasmania, at Bellerive (Miss Winifred M. Curtis; Sept. 1945, Oct. 1947—TYPE).

Collector's notes:

This species grows on a dry hillside carrying open vegetation. Although the aspect is southerly, the locality is one of the earliest in the district. Common plants in the association are *Gahnia radula*, *Lomandra longifolia*, *Dillwynia divaricata*, *Hovea heterophylla*, *Hibbertia acicularis*, etc., also the moss *Polytrichum*. Such low-growing plants predominate. The only shrubs are a few scattered examples (not more than about 12 ft. in height) of *Casuarina siberica*, *Eucalyptus amygdalina* and *Dodonaea viscosa*. The orchid is found in bare patches of sandy soil. In previous years they have been quite plentiful (several dozen could be collected without difficulty in an area of about half an acre), but this year they are very infrequent.

Coladenia caudata (sp. nov.) is more closely allied to *Cal. reticulata* FitzG. than to other species, but the stout tail-like points to all the segments in the new species are very characteristic.

Outwardly it resembles also *Cal. echidnachila* Nich., but in this rare form the labellum fringe is different and the points of all the segments are slender and longer.

II. *PRASOPHYLLUM CONCINNUM*, sp. nov.

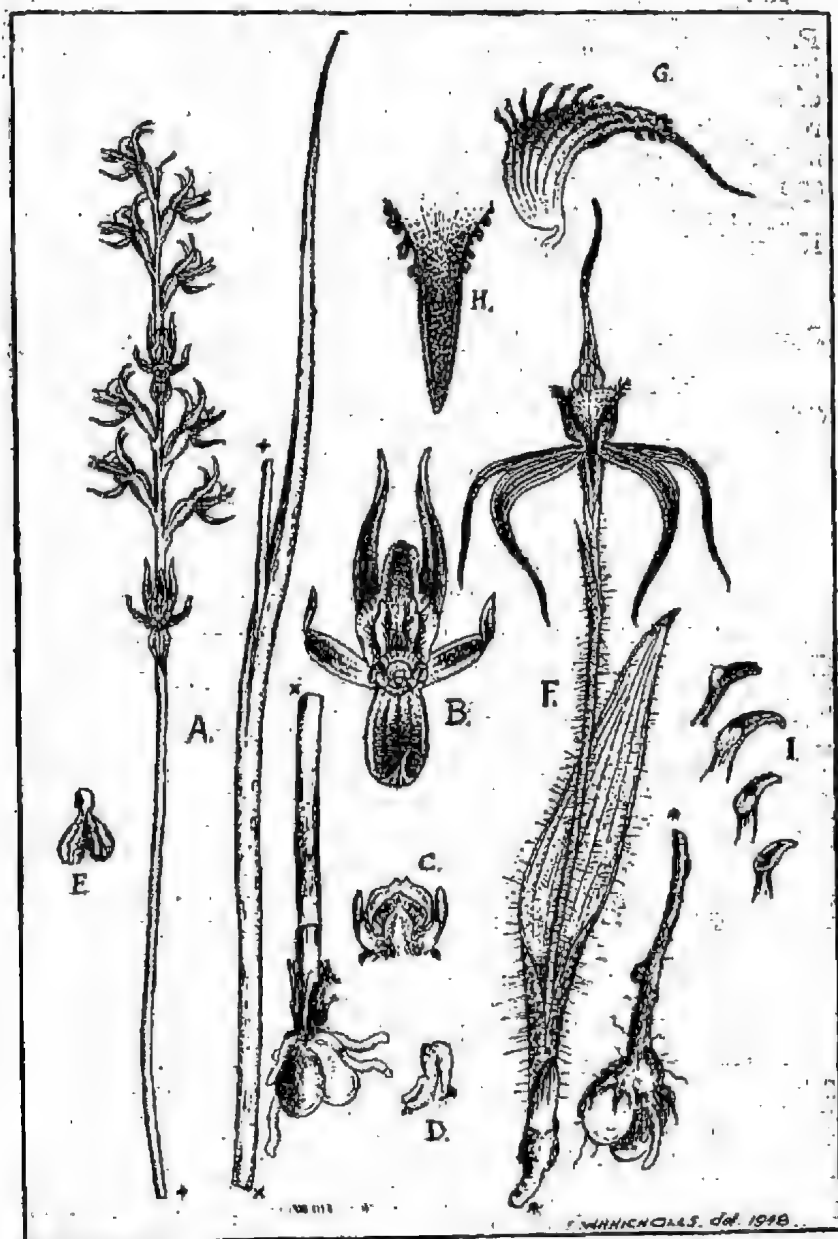
Planta gracilis, 30-40 cm. alta. Folium teres, vaginatum, erectum, saepe inflorescentiam non-excedens. Spica laxa; flores virides vel flavo-virides badii. Pedicelli breves. Ovaria turgida. Sepalum dorsale lanceolatum, erectum, acumminatum, incurvum, circiter 10 mm. longum. Sepala lateralia parallela, lanceolata, falcato-recurva, concava, ad basin cohaerentia (1 mm.); circiter 10 mm. longa. Petala patentia vel incurva; linearia-acuta, circiter 8 mm. longa. Labellum non-mobile, erectum recurvum, ovato-cuneatum, circiter 8 mm. longum; pars membranacea pallida, ad basin lata, marginibus integerrimis, prope apicem angustum; pars callosa angustata, virides, paene ad apicem prominente producta, ad basin canaliculata, marginibus lateralibus elevatis. Columnae lacinas laterales brevis, apicibus obtusis, emarginatis. Anthera parva. Caudicula brevis.

: A slender terrestrial herb, 30-40 cm. high. Leaf slender, terete, sheathing at base, erect, the lamina not exceeding the spike. Flowers in rather a lax spike at about 10-14 cm., green or yellowish-green with brown markings. Pedicels short. Ovaries turgid. Dorsal sepal about 10 mm. long, lanceolate (somewhat narrow), erect acuminate, the tip often incurved. Lateral sepals equal to dorsal, parallel, lanceolate, falcate-recurved; outer margins prominently incurved, connate only for about 1 mm. from the base. Petals about 8 mm. long, spreading or incurved, linear, acute.

Labellum rigid on a stout claw, erect, recurved in its distal third, ovate-cuneate, about 8 mm. long; membranous part pale-coloured, rather wide towards the base, and narrow beyond the bend, margins entire throughout; callous plate prominently raised upwards, rather narrow, green, extending from the bend almost to the extreme apex; a prominent channel towards the base, with two lateral lobes, the outer margins of which are raised and entire. Column appendages very short and stout, obtuse, with an emarginate apex, a small lobe at base. Anther small. Caudicle short.

Flowering: November-December.

Distribution: Tasmania, at Blackman's Bay, on sandy heath land (Miss Winifred M. Curtis; Nov. 30, 1947—TYPE).



Two New Species of Orchids from Tasmania.
(For key, see page 234.)

- This attractive species is closely allied to *P. fuscum* R.Br. and *P. alpinum* R.Br., but it differs from both in a number of important particulars (see plate.) Chief difference is the presence of lateral lobes towards the base of the labellum, a feature not readily discernible in such small flowers without the aid of a magnifier. The specific epithet is in allusion to the neat, immaculate appearance of the plant when in bloom.

Type material of both new species has been lodged in the National Herbarium, South Yarra.

KEY TO ILLUSTRATION

Prasophyllum concinnum: A—Typical specimen; B—Flower from front; C—Column, showing anther, etc. (pollinia removed); D—Column wing; E—Pollinia.

Caledonia caudata: F—Typical specimen; G—Labellum from side, showing long apex; H—Short tip of a labellum, showing glandular character; I—Types of calli from labellum lamina.

(For natural size of specimens see text.)

MAGPIE AS VOCAL MIMIC

Although both the White-backed and Black-backed Magpies have been recorded as vocal mimics (in a wild state), it is interesting to learn from Mrs. B. Long, of Macorna, via Bendigo, that she regards "Maggie" as one of the best of all mimics. Mrs. Long writes:

"When fowls got into the garden my pet magpie would manage one, but if there were more he would yell, 'Mother, quick, quick!', a phrase he got from my children when they hurt themselves at play. He also had my daughter's laugh to a nicety, and he learnt to call my son to get up after hearing Dad do so a few times. I was offered £5 for Maggie, but money would not buy him. However, he became very jealous of my last baby and nearly pecked one of his eyes, so I had to part with him. I gave him to a woman who would, I knew, be kind to him, but she had him only one week—he did not say one word then, but pined away and died."

LATE NESTING

On March 14 Mr. P. Fisch, of Doncaster, showed me the nest of a Spine-billed Honeyeater, containing two well-fledged young birds, situated at a height of about 8 feet in a pear tree in his orchard. This is the latest date on which I have ever seen a Spinebills' nest and also the first time I have seen one in an orchard tree. In point of fact, it seems a rare event for a Spinebill to nest away from native trees, the only instance of the kind I can recall being a nest in a California pine. The nest in Mr. Fisch's orchard, like all Spinebills' nests (and as distinct from other honey-eaters' homes) was warmly lined with feathers.

Late nesting has, of course, been a feature of the summer just closed. It has been more marked than in any season since 1937, when both native and introduced birds bred into February.—A.H.C.

A SET OF ABORIGINAL STONE TOOLS

By S. R. MITCHELL, Melbourne.

A recent find by the writer of small stone artefacts on the Mornington Peninsula is of particular interest in that they were probably the working tools of an aboriginal craftsman who used them where they were found. They were obtained from a limited area measuring 8 ft. x 4 ft. on a hard dune surface recently uncovered by wind erosion—the only artefacts found on at least half an acre.

They consisted of a number of microliths, micro-flakes, cores and wasters, and included the whole of the stone material on the site. This was near the trigonometrical station, shown on the military map as 508 feet above sea-level and about 150 yards south-west of a waterhole known to the early settlers of the Peninsula as the Blacks' Camp and a favoured aboriginal camping place. The waterhole was then extensive and permanent, but is now divided into two impermanent portions where it is crossed by the Lighthouse Road which leaves the Rosebud-Flinders Road about seven miles south of Rosebud.

The stone material gathered comprised: 32 Bondi points, 16 segments, 7 aberrant microliths, 30 sharp-edged flakes, 4 cores, 6 wasters or reject pieces.

Among the Bondi points were two well-formed examples 40 mm. long and of a fine-grained red quartzite, trimmed along the whole of the thick margin. One of them (No. 1 on plate) shows signs of much use and the other (No. 2) that it has been re-edged to form an effective scraping edge. One has a sharp, slightly-curved opposite margin, while on the other the margin is irregular and uneven (No. 2). The remainder are of a grey quartzite, difficult to work, the source of which Mr. R. A. Kelle tells me was probably a pebble-bed—the remnant of a fluvial deposit on the southern slope of Arthur's Seat, $5\frac{1}{2}$ miles to the north, containing pebbles from the metamorphosed base rock of the Central Peninsula.

These are classed as points (row 1) and are made from thick, short, asymmetric flakes with more or less trimming on the thick margin. Some of the broader forms with further retrimming would result in asymmetrical segments. They range in length from 15 to 30 mm. and in width from 8 to 12 mm. Of the 16 segments (rows 2, 3 and 4) six are asymmetrical forms made from flakes trimmed along the thick margin and around the butt. They are borderline types between segments and points. The others approach the normal segments with more or less trimming on the thick margin. One only can be classed as a trapeze.

The seven aberrant forms (row 5) show trimming on portion of the margin of irregularly shaped flakes. One thick triangular-

shaped flake has some trimming towards one end and appears either to be a segment in the process of making or has been discarded because of the thickness of the stone. The leaf-shaped and fortuitous sharp-edged flakes number 30 (rows 6 and 7) and would all serve as cutting tools, although they show no evidence of this. They range from 10 to 25 mm. in length. Some are suitable for making microliths.

The cores (row 10) are irregular in shape and are small, the largest being 35 mm. long. The flake scars show that the flaking property of the quartzite was poor, which is also indicated by the irregularity of the microliths.

Six pieces (row 9) are classed as wasters, with no sharp edges and were generally too thick for use in making any type of stone artefacts.

There is a slight difference in the grey quartzite used. The majority were made from a coarser-grained quartzite, but a proportion from a finer-grained, denser variety. No core of the latter was found.

Hammer stones are seldom found on the Mornington Peninsula; in all probability the base of a ground-edge axe was used for the purpose of knapping flakes from cores.

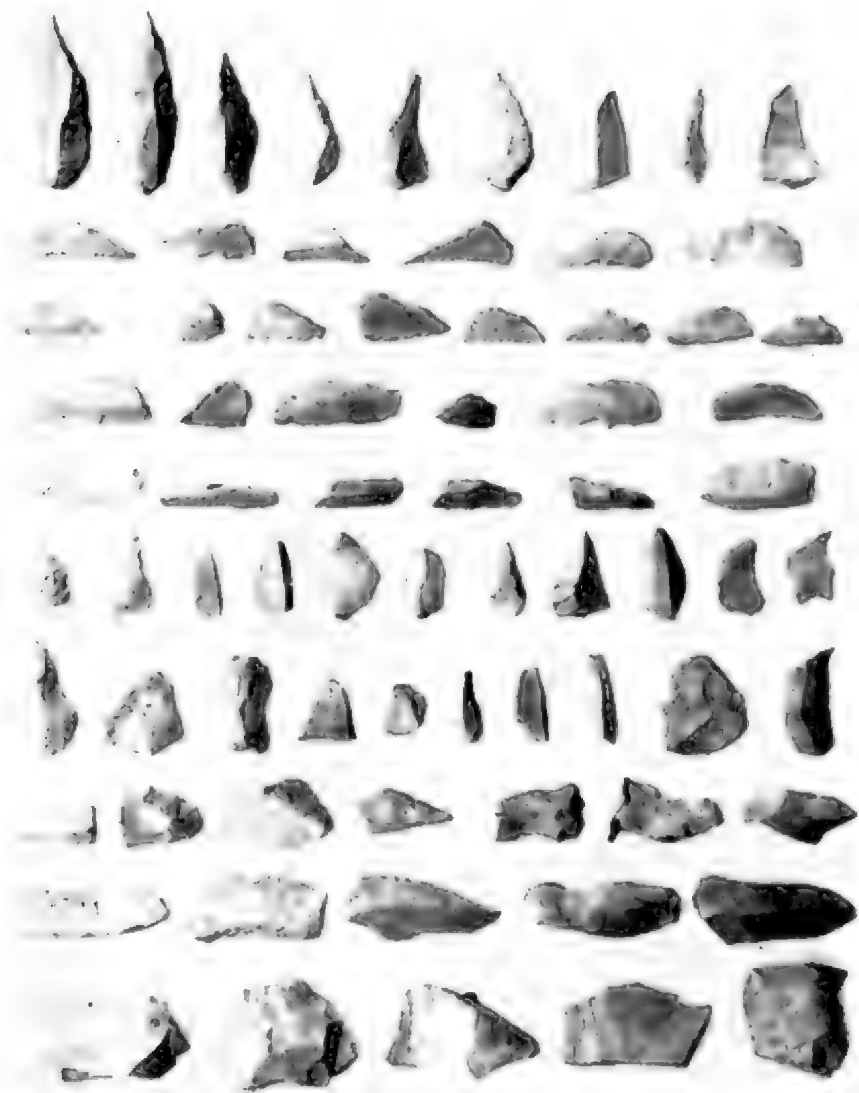
From a study of the material from this isolated site it is probable that a series of flakes with a proportion of wasters was produced, and were used as the occasion arose. The cores indicate that no more useful flakes could be made from them. Suitable flakes were used and re-edged to produce finally the conventional types. Over 45 per cent. of these artefacts show use as scraping tools.

A dune ridge crosses the Cape Schank road and continues for about 300 yards. It is well-grassed and close to the waterhole. Casuarina and other trees and shrubs grow on it, and flakes, chips and shell remains are plentiful, indicating former aboriginal occupation. On the eastern end of the ridge, erosion has commenced and some 60 microliths were collected; these were chiefly points.

We can visualize the primitive life from what we know of it when this waterhole was the centre or gathering-place of the natives of this part of the Peninsula.

Close to this permanent water supply lived members of the Bunurong tribe, sheltered by the vegetation growing on the consolidated dune-ridge nearby. Camp activities were carried on; women visited the coast and gathered shell-fish, small animals and vegetable foods; the men hunted the kangaroo and emu and captured possums and snakes; the children played around the camp or disported themselves in the water. Farther away, a few hundred yards from the main camp, an old man, presumably the spear-maker of the tribe or an adept in making wooden implements,

PLATE XII



Aboriginal Stone Tools.
(For key, see article.)

camped alone behind his brush breakwind. Tea-tree shoots, bent roots or short sticks would be brought to him by the more active men for fashioning into spears, boomerangs or throwing-sticks.

We can see him knapping a couple of pieces of quartzite brought from the pebble-bed and valuable because of its scarcity. With the butt of his stone tomahawk, flake after flake was struck off until a small core only was left. For a solid anvil to rest the quartzite on, a piece of rock or another axe may have served. Selecting a sharp-edged flake, the protuberances on the shoots were cut off, also the bark, and when the shaft needed thinning, this was done by scraping. If bent, it was heated in the smouldering ashes of his fire and the bent part straightened.

He would use some flakes for scraping because of the conventional shape. To make a hard, sharp point, the end of the shaft was charred in the fire and scraped away until the desired result was attained.

He may have set some of the selected flakes in resin, or in a cleft on the end of a short stick, and to get an effective scraping edge pressed off minute chips on the exposed parts. With use, this edge became dull but was readily re-sharpened by further pressure flaking, ultimately producing a recognizable type, one we classify as a geometric or point, both of which, however, functioned in the same way.

In such a way evolved some of the stone industries of prehistoric man of Europe, Asia, Africa and elsewhere; similar types of small tools fashioned from flint or quartzite were made by them 10,000 to 15,000 years ago.

BIRDS' USE OF AROMATIC PLANTS

When Mr. and Mrs. P. Fisch, of Doncaster, found numerous sprigs broken off two species of native plants in their garden—the Geraldton Wax-flower and the Snowy Sand-Myrtle—they supposed that children were to blame; but later they saw English sparrows doing the damage, and later again they found the missing sprigs woven into the sparrows' nests. This tallies with what a woman living at Cheltenham told me in 1933—she said that nesting sparrows were a thorough nuisance among her Geraldton Wax-flowers.

Now, what is the attraction for the birds? Superficially, the plants named do not seem very suitable for nesting material, and so (and in spite of the fact that few birds have a strong sense of smell) we are faced with the possibility that the sparrows appreciate the aromatic odour of the plants and use them as antiseptics. The same consideration obtains in regard to birds' use of the insect-repelling pyrethrum, thyme, and rue, concerning which Mrs. Edith Coleman wrote informatively in this journal a few years ago. (*Vic. Nat.*, Jan. and Sept. 1944, and Jan. and Feb. 1945.)

It remains to be determined to what extent this use of odorous plants in nests is related to "anointing" by birds—their habit of rubbing ants, lemon-peel, walnut-juice, aromatic leaves, etc., on their bodies.—A.H.C.

FAMILY LIFE OF BUDGERIGARS

By EDITH COLEMAN, Blackburn, Vic.

If the fancy run to exhibition budgerigars, the way of the expert must be followed; but for those who have no such ambition, and little interest in the problems of colour-breeding, there are other delights.

If you love the merry prattle of "budgies" in the garden, give them an aviary that permits flight and a free wing. With fresh water daily, and seed such as they might gather from herbs and grasses, they will show how capably they manage their own affairs in an admittedly difficult land.

And the garden will be musical throughout the year, for budgies are vocal, not only in winter, but even on dark nights.

Moreover, unlike that of most birds whose love-making wanes with the coming of winter, budgie-love outlasts the passionate fervour of spring.

Are there other birds whose ways so closely mirror our own?

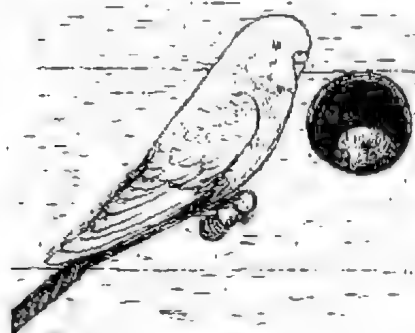
Among budgies, as among humans, there are misfits and "triangles"; spite and jealousy too, when one lady budgie wins more than her share of attention.

A jilted hen will "take on" any bird in the aviary, or she may lapse into a "green-sickness," moping to an alarming degree. When nest and mate are won, she may start on her maternal way with gory feathers—which her mate will preen most lovingly.

I do not doubt that many budgies mate for life. Nothing is more touching than their so obvious attachment, as unrestrained as that of any 'Arry and 'Arriet in a park. If one separates betrothed birds, both will fret, refusing to glance at other wooers, no matter how charming or persistent.

Every year is leap year with budgie "girls." If a hen takes a fancy to one special cock, she will "tell" him so, and it usually means a happy match.

For long periods a cock will perch at the nest-opening, creaming delectable meals for his brooding mate. Should she fail to appear, he summons her by tapping with his bill, and again more insistently,



"I sit by your window."—For long periods a devoted cock sits at the "window" of his brooding mate, preening her head, plying her with food and kisses. Then he offers his head for her to preen and fondle.

until she is visible. Should she fail to appear he may, alas, tap at another casement!

In the orthodox nesting-box one sees the fledgling next to quit the nest peering through the opening at its brave new world. It is perched on a peg just beneath the "window," well above its mother and the rest of the brood. In the cheese box, which for several reasons I prefer, with its lower opening, it is pretty to see the head of a brooding hen in the opening for her mate to peep. He feeds and caresses her even while she broods. Presently the head of a fledgling appears beside hers, sometimes two, making as pretty a picture of feathered felicity as one might hope to see.

One may see a cock bird sitting listless and dejected while his mate broods. A piercing, purring cry galvanizes him into action. It is the cry of a newly-hatched chick, audible even before the shell is fully broken. The father flies, not to the seed-dish, but to the bunch of grasses, for the immature seeds that make a soft, creamy pap. As he sits waiting for the cry that announces his fatherhood he calls up a picture of human fathers, in pre-hospital days, waiting for the cry which ended anxiety.

The baby budgie's cry is a surprising volume of sound to come from such a tiny, helpless creature. It probably has survival value. In a nest crowded with fat babies, a new arrival might quite easily be overlooked, even smothered. Its cry brings father and mother with food and hygienic attention. Human parallels are almost embarrassing! As in our own world there are selfless mothers and devoted fathers.

Some of the male parents almost starve themselves in feeding their families. There are solid fathers whom no Delilah could lure from the path of virtue; and there are minxes and dangerous little widows. One of these was the odd female in a cage of seven birds. She spent her days in challenging the mothers, trying to annex their mates as well as their nests, even tossing out their babies. Removed to another aviary, she promptly annexed a nest, as well as the attention of a father whose brooding mate was too engrossed to note his back-sliding.

And what a marvellous mother that little lady made! Three broods she launched without assistance, for their father knew them not. Her nest was a model of neatness. Daily we watched her sweeping the floor with her wings, carrying out excrement piece by piece. But feeding five lusty chicks left little time for grooming them, and because of this two of them developed undershot bills, attributed to lack of cleansing.

I should like to stress the fondness of these lovely birds for more assorted green food than is usually given them, for wattle and gum leaves, buds and flowers, for silver-beet and immature grass-seeds. They love to nibble pittosporum leaves. Their liking

for the stamens of eucalypts suggests that they may be useful pollinators. Like most birds they love chickweed, a herb still used in herbal therapy as a demulcent and refrigerant, for poultices to indolent ulcers, in ophthalmia, and as an ointment for skin troubles. It is said to cause indigestion in lambs, but from very early times it has been fed to caged birds, as we know from Turner—"Little birds in cages are refreshed with chickweed when they loathe their meate." (Gerard's translation.)

In Elizabethan days the plant was eaten as a pot-herb and the juice was believed to cure warts. One old author tells us that water of chickweed was given to children "for their fits, and its juice for their gripes." Parkinson (1567-1650), apothecary to James I, praised it as a poultice for sore legs—"and ye shall find help, if God will."

According to Dr. W. T. Fernie (1914) fresh chickweed juice produces sharp rheumatic pains and stitches in the head and eyes; also soreness of the liver with sensation of burning and bilious indigestion. Given curatively, on the homeopathic principle of like to like, in very small doses, it should cure those ills. Dr. Fernie ascribes its wide distribution all over the earth to some universal utility. So let us give chickweed, too, to our budgies. There is an old couplet:

All linnets, and lame ones and lean ones take heed,
You may feed, walk, and flourish by eating chickweed.

CORRECTION

In Mrs. Coleman's previous article on Budgerigars (*V.N.*, March, p. 216), in first line of last paragraph, read after "budgerigar" the words "normal green." In the various blues the forehead cap is usually white.

R.A.O.U. OUTING TO W.A.

As a number of members of the V.F.N.C. attended last year's congress and camp-out of the Royal Australasian Ornithologists' Union in Queensland, members generally may be interested to learn of the arrangements for the next congress and camp-out, to be held in W.A. On present arrangements excursionists from the east are due in Perth on Saturday, September 11. Several days will be spent in congress business and excursions about Perth. On or about September 16 the party will leave for Geraldton, whence they will be transported by road about 100 miles to the mouth of the Murchison River. It is expected that at that spot much interesting bird and plant life will be available for study. Intending excursionists should contact Mr. D. Dickison, General Sec. R.A.O.U., 386 Flinders Lane, Melbourne.

TAXONOMIC DIFFICULTIES IN THE GENUS *DIURIS*

By the Rev. H. M. R. RUPP, Northbridge, N.S.W.

The illustrated article by Mr. W. H. Nicholls in this journal for October, 1947, on the Western Australian species of *Diuris* meets a long-felt want. Orchid students in the eastern States have found serious difficulties in determining the identity of specimens from W.A., and we needed just the information Mr. Nicholls has given us.

One remark which he makes in the course of his article I fear I cannot endorse. He says, "Study of the genus *Diuris* does not present such great difficulties as are apparent in some other genera of Australian orchids." For my part, with the increase of material that is coming in from collectors (at least in New South Wales), I find this genus becoming more and more difficult from the taxonomic point of view. It is true that the problems presented by the diminutive flowers of such groups as the section *Gnophisium* of the genus *Prosopphyllum* do not confront us here; but they are replaced by others no less perplexing. Possibly these are experienced more acutely in New South Wales than elsewhere; for there can be little doubt, I think, that *Diuris* develops a far greater variety of forms in this State than in any other. The following tabulation of all Australian species published to date will illustrate this. States are indicated by their initials.

It has been suggested that some of the species published for New South Wales may ultimately prove to be merely local variants from the type forms of species previously described. While not concerned to deny the possibility of this, I doubt very much whether it would eliminate more than three or four at most. There would still remain a large majority of species apparently peculiar to New South Wales. At the time of writing I have under preparation descriptions of three new species from our Central Western Slopes, none of which, in my opinion, can possibly be regarded as variants of any species previously described. From the same area I have under consideration a very large number of other forms, some of which I am quite unable to identify with any known species. Obviously it is undesirable to go on multiplying species indefinitely if it can be avoided; but the extraordinary variety of forms now being brought to light demands some attempt at explanation. Credit for the observation of these forms is due to Messrs. G. W. and P. Althofer, of Dripstone, who have seized the opportunity of an exceptionally good season to cover large tracts of the area, collecting as many different forms of *Diuris* as possible. Duplicates of some of these have been sent to Mr. Nicholls, who will, I think, endorse my views as to the difficulty of determining their identity with any certainty.

It seems to me that such difficulties may be explained at least in part by the two following considerations:

(1) Descriptions of species are often formulated too rigidly. In many instances they are drawn up from specimens found in one area, or even one precise locality. If the species described is actually restricted to that area, variations from the type may perhaps be slight and unimportant (though this is not always the case). But it is always possible that what is essentially the same species may be discovered in another area, where differences of soil, climate, or environment may cause variations so marked that the plant does not fit well into any published description, and identity becomes doubtful. We must, of course, describe carefully and accurately the plant which we choose as the type of our species; but in doing so we ought to make clear what many people fail to take into account, that variations from this type are almost certain to occur within the species, and must be allowed for by those who use our descriptions. Collectors should realize that no two plants are ever completely identical, just as no two individuals of the

Species	Distribution in Australian States					
D. abbreviata	Q.	N.S.W.				
aequalis		N.S.W.				
alba	Q.	N.S.W.	V.			
aurea	Q.	N.S.W.				
bracteata		N.S.W.				
brevifolia		N.S.W.	V.	S.A.		
brevissima		N.S.W.	V.			
carinata						W.A.
Colemanae	Q.	N.S.W.				
cuneata		N.S.W.				
dendrobioides		N.S.W.				
fastidiosa			T.			
emarginata						W.A.
flavopurpurea		N.S.W.		T.		
lucida						W.A.
lineata		N.S.W.				
longifolia		N.S.W.	V.	S.A.	T.	W.A.
maculata	Q.	N.S.W.	V.	S.A.	T.	
palachila		N.S.W.	V.	S.A.		
pallens	Q.	N.S.W.				
palustris			V.	S.A.	T.	
pauciflora						W.A.
pedunculata	Q.	N.S.W.	V.	S.A.	T.	
platichila	Q.	N.S.W.				
polymorpha		N.S.W.				
punctata	Q.	N.S.W.	V.	S.A.		
Purdiei						W.A.
rhomboidalis		N.S.W.				
secundiflora	Q.	N.S.W.				
semilunulata		N.S.W.				
setacea						W.A.
Sheaffiana		N.S.W.				
striata		N.S.W.				
sulphurea	Q.	N.S.W.	V.	S.A.	T.	
tricolor		N.S.W.				
venosa		N.S.W.				
victoriensis		N.S.W.	V.			
	11	29	12	8	6	7

species *Homo sapiens* are ever exactly alike. But in many instances, I think, original descriptions require expansion to cover variations which were not realized when they were compiled, although such expansion must not be overdone or the description will be too cumbersome and involved. Well-established variants, of course, can be, and are, described separately under varietal names.

(2) The character of many of the flowers sent in by the Althofer brothers strongly suggests that a good deal of natural hybridization is going on amongst species of *Diuris*. I am well aware that we should not attempt to escape taxonomic difficulties merely by pronouncing a plant to be a hybrid because it resembles both of two known species. But the circumstantial evidence is sometimes well-nigh irresistible; and there seems no good reason to doubt that hybridization does occur. Many species of *Diuris* are obviously closely related; and where they occur together in any numbers it would be surprising if inter-specific crossing never took place. Lotsy long ago pointed

out the importance of hybridization as a factor in the evolution of plant life; and that it has played, and is still playing, a large part in the development of orchid species seems to me beyond question.

Let us aim, then, at making our specific descriptions as comprehensive as is possible without sacrificing conciseness; let us remember that variations from the type are almost certain to be met with sooner or later; and if in addition we realize that in all probability natural hybridization is contributing to the development of new and permanent species under our very eyes, I think we shall be less perplexed by the difficulties presented in the study of a polymorphic genus such as *Diuris*.

"WILD FLOWERS OF AUSTRALIA"

Miss Thistle Y. Harris, Lecturer in Biological Science at the Teachers' College, Sydney, has surely made the most successful attempt so far to meet a constant and growing demand for popular guides to our native flowers. It is just a decade since the appearance of her first *Wild Flowers of Australia*, and a second book under the same title was published at the end of last year by Angus & Robertson, Sydney (7" x 9", 206 pp., 67 colour plates, brown cloth binding, price 17/6). The new volume is larger and more attractively presented and the same plates (with two extras) are much more clearly reproduced in their larger size. It is indeed a matter for "deep regret that the artist, Adam Forster, did not live to see this fruition of his labour." Good colour delineations of 250 selected species are an inducement that will assure the popularity and success of this book.

On the whole, the illustrations give a fair cross-section of Australia's more spectacular flowers. As the artist lived and worked at Sydney there is naturally a predominance of Hawkesbury-sandstone flora, e.g., four species of *Styphelia* are figured, yet the genus is uncommon or wanting in most wild flower areas of the Commonwealth. Very few of the myriad floral gems in south-west Australia are featured, while Tasmanian and Northern Territory subjects also receive rather scant attention. In the descriptive matter, some important characters have been overlooked, the powerful perfume of *Crimineus flaccidus* for instance. Golden Everlasting is condensed to four lines and no mention made of the success attending horticultural treatment of this showy plant—long available as a garden annual under a wide range of brilliant colours. Several common names are not very apt: *Diuris punctata* is called "Dotted Double-tails," yet the form with spots is extremely rare and few have ever seen it. *Brunonia* is claimed to be an annual on p. 44, but it is called a perennial on p. 142. Personally, I have never known the Blue Pincushion to be anything else than an herbaceous perennial.

Perhaps the most weighty criticism which can be offered is that plates and descriptive text follow no particular order. However, a botanist will have little difficulty in finding his way through the book, thanks to its good scientific index and key to families which is based on von Mueller's use of macroscopic characters to run them down.

Both Miss Harris and the publishers are to be warmly complimented upon this Australian production, which is as excellent as any similar work I have seen from abroad and is, as stated on the charming cover-flap, "a de luxe edition . . . that anyone would be proud to own." Victorian naturalists should certainly try and secure for their bookshelves this fine volume by a fellow-member of the F.N.C.

J. H. WILLIS.

AN AUSTRALIAN PLANT IN GREAT BRITAIN

During a visit to Mount Buffalo early in 1942, seeds of several native plants were collected on the Plateau and despatched per Mrs. Edith Coleman, of Blackburn, to Mr. G. W. Robinson, formerly Director of the Physics Garden, Chelsea, London, and later of Oxford. Of the seeds that were viable, one species only, *Veronica Derwentia*, the "Derwent Speedwell," withstood the war blitz on glasshouses and the severe London winters. When Mr. Robinson moved to Oxford he took seedlings of the Veronica with him. Mr. Robinson advised Mrs. Coleman that the plants survived in open ground out of doors, and at an autumn meeting of the Scientific Committee of the Royal Horticultural Society, England, he exhibited flowers. He expressed his pleasure at raising and distributing the plant again and found it a most interesting and decorative subject.

Further reference has since been made by Mr. Robinson in the *Journal of the Royal Horticultural Society, London*, Vol. LXXII, Part 10, October, 1947, pp. 400-1, which is quoted as follows:

"... I find it difficult to explain why it [*Veronica Derwentia*, the "Derwent Speedwell"] is so rarely seen outside botanic gardens. From a purely horticultural point of view, it is of interest in that it is the only Australian plant which has survived recent winters in the open in this part of the country, and also that it was amongst the first Australian plants to reach us. It is an almost glabrous perennial, growing some 2 to 3 feet high, with sessile lanceolate serrate leaves some 2 to 4 inches in length and tapering to a long point. The flowers are white (or slightly tinted), relatively large and borne in racemes some 4 to 8 inches long in the upper axils of the leaves. It is found in many parts of Australia and also is a common plant in Tasmania.

"The earliest reference is in Andrews' *Botanists' Repository*, Vol. 3, and plate No. 531 is quite a good figure. The text runs: 'This new species of *Veronica* was communicated to us by A. B. Lambert, Esq. It is a native of Botany Bay, on the banks of the Derwent, and was sent over by one of the settlers. The abundance and agreeable fragrance of its flowers render it deserving of a place in any collection.' The date of this figure is uncertain, but other plates in the same volume bear the dates 1806 and 1807. In 1814 the plant was again described in the *Botanical Magazine*, t. 1660, by R. Brown under the name *V. labiata*, though he does not say why he rejected the earlier name. The name '*Derwentia*,' by the way, he ascribes to Littlejohn, and not to Andrews. The plate shows a pale-blue flowered plant, is a poor drawing and altogether seems extremely doubtful. A later *Botanical Magazine* plate, t. 3461, also as *V. labiata*, is much more like the plant; this was flowered in 1836, in Glasgow Botanic Gardens. The only reference I can find in more recent times is *Journal R.H.S.*, Vol. 38, where Irwin R. Lynch gives it an excellent tabloid description as 'herbaceous in habit and almost European in appearance.' Mr. Preston tells me that they still have the plant at Cambridge.

"The quotation from Andrews' *Repository* is somewhat misleading. The River Derwent from which it is named is probably the Tasmanian river of that name, but the plant may also have been collected in the neighbourhood of Botany Bay, as it is found in New South Wales. It is also recorded from Victoria and the wetter parts of South Australia."

Though the New Zealand Veronics are widely represented in our Botanic Gardens, the species native to Victoria seem to be non-existent. Private gardens completely ignore the Victorian plants as herbaceous subjects. The newly-formed Garden Group in the Club might consider the genus as specially desirable to bring to notice again. *Veronica Derwentia* is so widely distributed as to be almost commonplace. The species can still be

found as near the city as Bayswater. In the Dandenong and Healesville ranges, it is frequently regarded as a weed. The Mount Buffalo granite appears to give the species a splendid vigour. During a visit there from December 26th to January 9th last, the plant was in a zenith of bloom everywhere; nearer the Horn at a higher elevation the flowers were tinged with blues and mauves. The foliage also takes on rich tints, due to late frosts. On New Year's Day last the species was seen flourishing all along the Pretty Valley road up to the Bogongs, the plants attaining fullest stature (5 feet) at about 5,200 feet altitude.

Another species, *Veronica niven*, the Mountain Speedwell, is also common on the Buffalo Plateau. The plants grow in clumps up to 18 inches high in alpine meadows, with fine-cut leaves and attractive mist-blue flowers; of a more prostrate habit, not so common, *V. serpyllifolia* inhabits open bogs on the Buffalo. All three species propagate readily from seed and make very desirable alpinists in any garden.

H. C. E. STEWART.

VISIT TO LORNE

The Lorne excursion on Saturday, February 21st, attracted a full bus of over 30 members, and a perfect day afforded occasion for enjoying the coastal physiography along portion of the Great Ocean Road under the best possible conditions.

Botanically, the trip proved of abundant interest. Especial admiration was evoked by the flowering of the Moonah (*Melaleuca pubescens*) along several miles of terrain through Anglesea, Airey's Inlet and beyond to Eastern View. On return via Torquay, the care bestowed on preserving this fine tea-tree in some private gardens was pleasingly apparent. The profuse occurrence of the White Ixodia (*I. achillrolepis*) between Bellbrae and near the Anglesea River was a delightful surprise. It was good to see many acres of this sturdy composite, some plants up to 2½ feet high, in the ascendant again after the fires of the past decade.

On the outward journey a brief halt was made at the Geelong Gardens, where splendid trees of Kurrajong (*Sterculia diversifolia*) hybrids, and the Queensland Lace-bark (*S. discolor*), were a riot of colour. Beneath the last-named was a thick ruby carpet of fallen blossoms. Two exotic plants, members of the Solanaceae, and rarely seen in Melbourne—*Solanum acutum*, a mass of bright blue, and *Solanum nitida*, with immense flowers of pale yellow—do well in these gardens. Curiously, another member of the same family, a single plant of *Solanum marginatum*, a garden escapee, was found on a vacant allotment in the main street of Lorne. The formidable array of spines prejudices cultivation of this unusual African native.

H. C. E. STEWART.

ECHIDNA IN A SYDNEY SUBURB

In a letter from Roseville, Mr. Alce Costin writes: "The bush near here has been so frequently burnt during the past few years that it has lost much of its former beauty. However, I was recently surprised to see a fox and an echidna quite near a busy road. The last fox was seen in these parts about five years ago, but I have never heard of a 'porcupine' at all.

"The echidna's actions were an education to watch. As soon as he saw me, he ran behind a ledge of rock and, despite the branches and stones beneath him, literally 'sank' into the ground. Soon only the tips of a few quills showed above, and the more you looked at these, the more they appeared to be just so many burnt twigs half buried in the soil. It is good to know that at least some of the original fauna survives hereabouts."

A NEW LOCALITY RECORD OF THE ELBOW ORCHID

The Elbow Orchid (*Spiculæa Huntiana*) has been found on the Plenty Ranges at Kinglake. To the surprise of those who observed it, the plant was not only widespread in the district but quite abundant.

The writer, who spent a week or so in the Mason's Falls area during the first half of January, noted hundreds of plants between Pheasant Creek and

the Sugarloaf. More than four dozen were counted in a small area on the property of Mr. A. A. Brunton.

Mr. A. J. Swaby, while holidaying at Healesville, also found the species flowering there this season. Since its original discovery in Victoria by the late Mr. A. B. Braine at Cravensville, near Tallangatta, and later in the Pyrete Ranges near Gisborne by Mr. George Lyell, this curious plant has been located at a number of places, especially in eastern Victoria, notably Harrietville, Mt. Buffalo, Mt. Cobbler, Mt. Howitt, Mt. Wellington, Dargo High Plains, Maffra, and in and around Marysville—even in the main street of that township. Daylesford and Egans-town seem to be the most westerly stations. Nevertheless, it is still of sufficiently infrequent occurrence to be worth recording.

Spiculæa Huntiana is one of those peculiar terrestrial orchids which is evidently a holo-saprophyte. Like the Hyacinth Orchid (*Dipodium punctatum*), it is leafless and dependent for its complete nutrition on co-existence with a mycorrhizal fungus. Its root-system is almost vestigial, being mere excrescences on a very small tuberous rhizome which lies buried just beneath the surface of the ground. From observations on the root-system of a



Elbow Orchid, *Spiculæa Huntiana*
(F.v.M.) Schltr.

number of plants, it is difficult to believe that the plant is able to store enough food in its rhizome to permit survival for long as a perennial. Its infrequency of appearance and its abundance when it does occur (as on this occasion) leads one to suggest that for reproduction it possibly depends on growth from seed, and its development therefrom might take place only after a succession of favourable seasons.

There is nothing obvious in the rhizome to suggest development of a new crown or of a lateral offset which would develop into a food store for the one or more years that may follow before it flowers again.

For the guidance of those who may wish to seek the plant in future years, it may easily be mistaken for a dead and withered Sundew (*Drosera auriculata*), which is common enough in the Kinglake peppermint and myrsine

stringy-bark forests where the orchid was abundant. Plants were seen in places where there was ample sunlight but plenty of shelter, more often beside paths, tracks and animal pads rather than in the denser interior of the forest, and wherever they grew there was always a cover of forest debris—decayed and decaying gum leaves and twigs.

Spicula Huntiana is one of our terrestrial orchids that challenges observers and investigators, and some careful field-work on its habits and habitats may make much easier the laboratory work which such a curiosity deserves.

J.R.G.

OTHER RECORDS OF THE ELBOW ORCHID

Since its discovery in Victoria at *Cravensville* in north-east Victoria by Mr. A. B. Braine (1917) this remarkable species has been recorded from the following places:

Pyrcle Range, near Gisborne (W.H.N. and G. Lyell); near *Harrietville*, Mt. Kent (D. Matthews); *Mt. Cobbler*, *Holmes' Plain* near Mt. Howitt; *Dandongadule Gorge* (D. Matthews and W.H.N.); *Mt. Buffalo* (H. Stewart); *Yarragon* and *East of Bubi Bubi* (R. Bond)—the farthest south for this orchid; *Daylesford* (J. H. Willis); *Moe* (N. Holmes); *Maffra*, *Mt. Wellington* (D. Matthews); *Dargo Plains* (J. H. Willis); *Marysville* (W.H.N.). The highest elevation where this orchid has been seen is 5,645 feet.

(The place-names in italics are districts in N.E. and E. Victoria.)

W. H. NICHOLLS.

BIBLIOGRAPHY OF J. H. GATLIFF*

Compiled by F. S. COLLIVER, Melbourne.

1887

1. Gatliff, *Vic. Nat.*, IV, No. 4 (Aug.), pp. 57-60. A List of Some of the Shells of the Marine Mollusca found upon the Victorian Coast. Pt. I.

1888

2. Gatliff, *Vic. Nat.*, V, No. 8 (Dec.), pp. 111-114. A List of Some of the Shells of the Marine Mollusca found upon the Victorian Coast. Pt. II.

1891

3. Gatliff, *Vic. Nat.*, VII, Nos. 11-12 (Mar.-Apr.), illd., p. 179. Description of a New Victorian Cone (*C. segraui*).

1898

4. Gatliff—Pritchard and, *Proc. Roy. Soc. Vic.*, X (n.s.), pt. II (May), pp. 140-141. On a New Species of Victorian Mollusc (*Corallophila wilsoni*).
5. Gatliff—Pritchard and, *Proc. Roy. Soc. Vic.*, X (n.s.), pt. II (May), pp. 236-284. Catalogue of the Marine Shells of Victoria. Pt. I.

1899

6. Gatliff—Pritchard and, *Proc. Roy. Soc. Vic.*, XI (n.s.), pt. II (Feb.), pp. 179-184, pl. XX. On Some New Species of Victorian Mollusca. (No. 2).
7. Gatliff—Pritchard and, *Proc. Roy. Soc. Vic.*, XI (n.s.), pt. II (Feb.), pp. 185-208. Catalogue of the Marine Shells of Victoria. Pt. II.

*"Father" of conchology in Victoria. Born Leeds (Eng.) 1846; died Melbourne, September 14, 1935, after 78 years in Australia. His collection of shells (7,270 spp.) is in the National Museum.

8. Gatliff—Pritchard and, *Proc. Roy. Soc. Vic.*, XII (n.s.), pt. I (Aug.), pp. 100-106, pl. VIII. On Some New Species of Victorian Mollusca. (No. 3.)
- 1900
 9. Gatliff—Pritchard and, *Proc. Roy. Soc. Vic.*, XII (n.s.), pt. II (Apr.), pp. 170-203. Catalogue of the Marine Shells of Victoria. Pt. III.
 10. Gatliff, *Vic. Nat.*, XVII, No. 3 (July), pp. 54-55. Note on Some Victorian Marine Mollusca.
 11. Gatliff—Pritchard and, *Proc. Roy. Soc. Vic.*, XIII (n.s.), pt. I (Aug.), pp. 131-138, pls. XX, XXI. On Some New Species of Victorian Mollusca. (No. 4.)
 12. Gatliff—Pritchard and, *Proc. Roy. Soc. Vic.*, XIII (n.s.), pt. I (Aug.), pp. 139-156. Catalogue of the Marine Shells of Victoria. Pt. IV.
 13. Gatliff, *Vic. Nat.*, XVII, No. 6 (Oct.), pp. 112-113, Text fig. Note on the Type of *Thalotia dubia*, a Shell described by Tenison-Woods.
- 1902
 14. Gatliff—Pritchard and, *Proc. Roy. Soc. Vic.*, XIV (n.s.), pt. II (Apr.), pp. 85-138. Catalogue of the Marine Shells of Victoria. Pt. V.
 15. Gatliff—Pritchard and, *Proc. Roy. Soc. Vic.*, XIV (n.s.), pt. II (Apr.), pp. 180-184, pls. IX, X. On Some New Species of Victorian Mollusca. (No. 5.)
 16. Gatliff, *Vic. Nat.*, XIX, No. 5 (Sept.), pp. 75-76. Notes on Perry's Conchology.
- 1903
 17. Gatliff—Pritchard and, *Proc. Roy. Soc. Vic.*, XV (n.s.), pt. II (Feb.), pp. 176-223. Catalogue of the Marine Shells of Victoria. Pt. VI.
 18. Gatliff—Pritchard and, *Proc. Roy. Soc. Vic.*, XVI (n.s.), pt. I (Sept.), pp. 92-95, pl. XV. On Some New Species of Victorian Mollusca, No. 6. Also observations on our common species of *Chione*, together with figures of same.
 19. Gatliff—Pritchard and, *Proc. Roy. Soc. Vic.*, XVI (n.s.), pt. I (Sept.), pp. 96-139. Catalogue of the Marine Shells of Victoria. Pt. VII.
 20. Gatliff, *Vic. Nat.*, XX, No. 7 (Nov.), pp. 89-91. Additions to the List of Victorian Marine Mollusca.
- 1904
 21. Gatliff—Pritchard and, *Proc. Roy. Soc. Vic.*, XVII (n.s.), pt. I (Sept.), pp. 220-266. Catalogue of the Marine Shells of Victoria. Pt. VIII.
 22. Gatliff—Pritchard and, *Proc. Roy. Soc. Vic.*, XVII (n.s.), pt. I (Sept.), pp. 338-339, pl. XX. On Some New Species of Victorian Mollusca. (No. 7.)
- 1905
 23. Gatliff, *Vic. Nat.*, XXII, No. 1 (May), pp. 12-13, Text fig. Description of Two New Species of Shells of the genus *Leuconopsis*.
 24. Gatliff, *Vic. Nat.*, XXII, No. 1 (May), pp. 13-16. Catalogue of Victorian Estuarine Univalve Mollusca.
- 1906
 25. Gatliff—Pritchard and, *Proc. Roy. Soc. Vic.*, XVIII (n.s.), pt. II (Feb.), pp. 39-92. Catalogue of the Marine Shells of Victoria, Pt. IX. With complete Index to the whole catalogue.
 26. Gatliff, *Proc. Roy. Soc. Vic.*, XIX (n.s.), pt. I (Aug.), pp. 1-4, pls. I, II. Some Victorian Marine Mollusca, New Species, and others Little Known.

- 1907
27. Gatliff and Bastow, *Proc. Roy. Soc. Vic.*, XX (n.s.), pt. I (Aug.), pp. 27-30, pls. III, IV. New Species of Australian Chiton from Queensland, *Enoplochiton torri*.
28. Gatliff, *Proc. Roy. Soc. Vic.*, XX (n.s.), pt. I (Aug.), pp. 31-37. Additions to the Catalogue of the Marine Shells of Victoria.
- 1908
29. Gatliff and Gabriel, *Proc. Roy. Soc. Vic.*, XXI (n.s.), pt. I (Aug.), pp. 365-367, pl. XXI. On Some New Species of Victorian Marine Mollusca.
30. Gatliff and Gabriel, *Proc. Roy. Soc. Vic.*, XXI (n.s.), pt. I (Aug.), pp. 368-391. Additions to and Revision of the Catalogue of Victorian Marine Mollusca.
31. Gatliff, *Vic. Nat.*, XXV, No. 5 (Sept.), p. 84, pl. IV. Description of *Voluta (Amoria) spenceriana*, sp. nov., from North Queensland.
- 1909
32. Gatliff and Gabriel, *Proc. Roy. Soc. Vic.*, XXII (n.s.), pt. I (Sept.), pp. 35-36, pl. XIII. Description of a New Marine Shell of the genus *Larina* (?).
33. Gatliff and Gabriel, *Proc. Roy. Soc. Vic.*, XXII (n.s.), (Sept.), pp. 37-46. Additions to the Catalogue of the Marine Shells of Victoria.
34. Gatliff and Gabriel, *Vic. Nat.*, XXVI, No. 8 (Dec.), pp. 117-118, pls. II, III. First Record of the Animal of *Voluta mamilla* Gray; with Remarks thereon.
- 1910
35. Gatliff and Gabriel, *Proc. Roy. Soc. Vic.*, XXIII (n.s.), pt. I (Aug.), pp. 82-86, pls. XVIII, XIX. On Some New Species of Victorian Marine Mollusca.
36. Gatliff and Gabriel, *Proc. Roy. Soc. Vic.*, XXIII (n.s.), pt. I (Aug.), pp. 87-98. Additions to the Catalogue of the Marine Shells of Victoria.
- 1911
37. Gatliff and Gabriel, *Proc. Roy. Soc. Vic.*, XXIV (n.s.), pt. I (Sept.), pp. 187-192, pls. XLVI, XLVII. On Some New Species of Victorian Marine Mollusca.
38. Gatliff and Gabriel, *Proc. Roy. Soc. Vic.*, XXIV (n.s.), pt. I (Sept.), pp. 193-200. Additions to and Alterations in the Catalogue of Victorian Marine Mollusca.
- 1912
39. Gatliff and Gabriel, *Vic. Nat.*, XXIX, No. 3 (July), pp. 46-48, pls. III, IV. On a New Variety (var. *bakeri*) of the Marine Shell *Fasciolaria australasia* Perry.
40. Gatliff and Gabriel, *Proc. Roy. Soc. Vic.*, XXV (n.s.), pt. I (Aug.), pp. 167-168, pl. IX. On Some New Species of Victorian Marine Mollusca.
41. Gatliff and Gabriel, *Proc. Roy. Soc. Vic.*, XXV (n.s.), pt. I (Aug.), pp. 169-175. Additions to and Alterations in the Catalogue of Victorian Marine Mollusca.
- 1913
42. Gatliff-Pritchard and, *Proc. Roy. Soc. Vic.*, XXVI (n.s.), pt. I (Sept.), pp. 63-66, pl. VII. On *Natica tasmanica* T. Woods; and description of a New Species of *Natica*.
43. Gatliff and Gabriel, *Proc. Roy. Soc. Vic.*, XXVI (n.s.), pt. I (Sept.), pp. 67-70, pl. VIII. On Some New Species and Varieties of Victorian Marine Mollusca.

44. Gatliff and Gabriel, *Proc. Roy. Soc. Vic.*, XXVI (n.s.), pt. I (Sept.), pp. 71-87. Additions to the Catalogue of the Marine Shells of Victoria.
- 1914
45. Gatliff and Gabriel, *Vic. Nat.*, XXX, No. 11 (Mar.), pp. 210-214, pl. XI. List of Recent Victorian *Brachiopoda*.
46. Gatliff and Gabriel, *Vic. Nat.*, XXXI, No. 5 (Sept.), pp. 82-84. Alterations in the Nomenclature of some Victorian Marine Mollusca.
47. Gatliff and Gabriel, *Proc. Roy. Soc. Vic.*, XXVII (n.s.), pt. I (Sept.), pp. 94-98, pls. XIV, XVI. On Some New Species of Victorian Marine Mollusca.
48. Gatliff and Gabriel, *Proc. Roy. Soc. Vic.*, XXVII (n.s.), pt. I (Sept.), pp. 99-103. Additions to the Catalogue of the Marine Shells of Victoria.
- 1915
49. Gatliff and Gabriel, *Proc. Roy. Soc. Vic.*, XXVIII (n.s.), pt. I (Nov.), pp. 115-123, pls. XII, XIII. Notes on Some Victorian Species of *Teredo*.
- 1916
50. Gatliff, *Vic. Nat.*, XXXII, No. 10 (Feb.), pp. 147-149. Text figs. Descriptions of two New Australian Varieties of Cowries.
51. Gatliff and Gabriel, *Proc. Roy. Soc. Vic.*, XXIX (n.s.), pt. I (Oct.), pp. 104-105, pl. VII. Description of a New Genus and two New Species of Victorian Marine Mollusca.
52. Gatliff and Gabriel, *Proc. Roy. Soc. Vic.*, XXIX (n.s.), pt. I (Oct.), pp. 106-113. Additions to and Alterations in the Catalogue of the Marine Shells of Victoria.
- 1917
53. Gatliff and Gabriel, *Proc. Roy. Soc. Vic.*, XXX (n.s.), pt. I (Sept.), pp. 21-31, pl. III. Additions to and Alterations in the Catalogue of the Marine Shells of Victoria.
- 1921
54. Gatliff and Gabriel, *Proc. Malac. Soc.*, XIV, pts. V, VI (Oct.), p. 173. Text fig. Description of a New *Phasianella* (*P. tomlini*) from Western Australia.
- 1922
55. Gatliff and Gabriel, *Proc. Roy. Soc. Vic.*, XXXIV (n.s.), (May), pp. 128-161. Additions to and Alterations in the Catalogue of Victorian Marine Mollusca.
- 1923
56. Gatliff and Gabriel, *Vic. Nat.*, XL, No. 1 (May), p. 10, pl. II. On a New Marine Bivalve Shell, *Hemidomax chapmani*, sp. nov.
- 1926
57. Gatliff and Gabriel, *Proc. Roy. Soc. Vic.*, XXXVIII (n.s.), (July), pp. 88-94. Additions to the Catalogue of Victorian Marine Mollusca.
- 1929
58. Gatliff, *Vic. Nat.*, XLVI, No. 6 (Oct.), p. 136. Alteration in the name of a *Cypraea*.
- 1930
59. Gatliff and Singleton, *Proc. Roy. Soc. Vic.*, XLII (n.s.), pt. II (Mar.), pp. 71-77, pls. II-IV. On the Relationship between "*Pecten*" *asperimus* Lam. and "*Pecten*" *antiaustralis* Tate, with a description of an allied Fossil Form.
- 1931
60. Gatliff and Gabriel, *Proc. Roy. Soc. Vic.*, XLIII (n.s.), pt. II (Feb.), pp. 202-232. Additions to and Alterations in the Catalogue of Victorian Marine Mollusca.

THE ELEVENTH COMMANDMENT

Volume IV of the Proceedings of the Sixth Pacific Science Congress, 1939 (pp. 891-896) contains an article written by W. C. Lowdermilk, Director of the Soil Conservation Bureau of the U.S. Department of Agriculture, entitled "The Eleventh Commandment."

From this article, which was written in Jerusalem and which describes the great dangers facing mankind due to inappropriate land use, we quote the following introductory remarks:

"Moses was inspired to deliver to the children of Israel, wandering in the wilderness, the Ten Commandments to regulate man's relation to his Creator and to his fellow-men. These guides of conduct have stood the test of time for more than 3000 years. But Moses, leading the Israelites in the wilderness, failed to foresee the great need of the future for an Eleventh Commandment to regulate man's relation and responsibility to Mother Earth, which must nourish all generations.

"If Moses had anticipated what we have seen in North China, Korea, North Africa, Asia Minor, Mesopotamia, and our own United States, namely the wastage of land resulting from man's practices or suicidal agriculture and the consequent man-made deserts and ruined civilizations—if he had foreseen the impoverishment, revolutions, and social decadence of billions of people through thousands of years—he doubtless would have been inspired to deliver an Eleventh Commandment to complete the trinity of man's responsibilities to his Creator, to his fellow-men, and to Mother Earth. Such a Commandment should read somewhat as follows:

"XI. Thou shalt inherit the holy earth as a faithful steward, conserving its resources and productivity from generation to generation. Thou shalt protect thy fields from soil erosion and thy hills from overgrazing by thy herds, so that thy descendants may have abundance forever. If any shall fail in this stewardship of the land, his fertile fields shall become sterile stoner and gullies, and his descendants shall decrease and live in poverty or vanish from the face of the earth."

AUSTRALIAN BIRD NAMES

It is proposed shortly to attempt to find more suitable vernacular names for those Australian birds which are at present "officially" known by names either too vague or too weighty. Numbers of amendments of the kind were made when work was previously done on the Checklist of Birds of Australia, and it is hoped that other useful titles will now be found. Names that appear to need amending include black-faced cuckoo-shrike (blue jay), golden-headed fantail-warbler, and some of the "whites" and "yellows" among the honeyeaters.

Members of the V.F.N.C. are invited to offer suggestions in the matter. Suggestions already made include advocacy of the greater use of aboriginal names. The motive here is worthy, but it has to be recalled that some native names are unduly long and appear to carry little meaning. Moreover, it is desirable that a bird's "surname" shall be one appropriate to all members of its genus.—A.H.C.

EWART'S FLORA OF VICTORIA WANTED

Mr. John Kendall, 6 Woodstock St., Canterbury, E.7, is anxious to obtain a copy of the above, either by sale or on loan.

WHAT, WHERE AND WHEN

General Excursions:

Saturday, April 10—Heenak. Subject: "Fungus Foray." Leader: Mr. J. H. Willis, B.Sc. Nash's bus leaves Batman Avenue 9 a.m. Bookings, 8/6 return, with Mr. R. D. Lee, Normanby St., Middle Brighton. Bring two meals and strong footwear; walk of about three miles.

Saturday, April 17—Maranoa Gardens. Opening of Frederick Chapman Memorial Gates and Planting Day. Leaders: Members of Wild-flower and Botany Groups, under the direction of Mr. A. J. Swaby. Meet at Kireep Road entrance to Gardens 2.45 p.m. (Take Mont Albert tram in Collins St., City, and alight at Parring Road stop.) All Club members are particularly requested to be present, and to invite others with a view to becoming "Friends of Maranoa." N.B.—Do not bring plants.

Saturday, April 24—Emerald, including Nobelius' Nursery. Subject: "Australian and New Zealand Vegetation." Leader: Mr. E. E. Lord. Train from Flinders St., 9.18 a.m., to Upper Ferntree Gully, thence road motor to Emerald. Bring one meal for lunch at Emerald Lake, 12 noon.

Saturday, May 1—Loch and Strzelecki. Subject: "Gippsland Giant Earthworm." Leader: Miss I. Watson. Parlour Coach leaves Batman Avenue 8.30 a.m. sharp. Bus bookings, 22/6 return, including midday meal, must be confirmed with Mr. H. Preston, 34 Coppin Grove, Hawthorn, E.2 (tel. Haw. 1853) on or before General Meeting on 12th April, otherwise preliminary booking cancelled.

Saturday, May 8—National Museum. Visit cancelled.

Group Fixtures:

Sunday, April 18—Marine Biology Discussion Group excursion to Altona Beach. Leader: Mr. J. J. Freame. Trains from Flinders Street to be announced at April Club meeting. Bring wading shoes and afternoon tea. (Low tide 3.15 p.m.)

Saturday, April 17—Geology Discussion Group excursion to Altona. Subject: "Foraminifera." Trains from Flinders St. at 1.29 and 2.15 p.m. (Further details from Hon. Sec. of Group, Mr. A. A. Baker, 53 Carlisle St., Preston, N.18.)

Monday, April 26—Botany Discussion Group. Royal Society's Hall, 8 p.m. Subject: "Salt Marsh Plants," by Mr. J. H. Willis, B.Sc.

Tuesday, May 4—Geology Group. Royal Society's Hall, 8 p.m. Subject: "Gold—Geological, Historical and Economical," by Mr. S. R. Mitchell.

Thursday, May 6—Wild-flower Garden Group. Royal Society's Hall, 8 p.m. Subject: "Maranoa Gardens," by Mr. W. Bury. New members welcome. (Hon. Sec. of Group, Mr. H. Preston, 34 Coppin Grove, Hawthorn, E.2.)

Friday, May 7—Marine Biology Group. Royal Society's Hall, 8 p.m. New members invited to join up. Particulars from Hon. Sec. of Group, Miss W. Taylor, 13 Jolimont Square, Jolimont, C.2 (tel. MY 4269—day only).

A. A. BAKER,
Excursion Secretary.